Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,0 g 4
4. Edition
En

PES 4 M 50 C 320 RS 103
RSF 375 / 2250 M 19
Komb.Nr. 0 400 074 978
Sales model 400 074 977

supersedes 0.81
company Daimler-Benz
engine Om 615
44 kW (60 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80 (1,65-1,85) mm (from BDC) 20mm Control rod travel

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning compensating valve mm 6
1000	$12,7^{+0,1}$	3,2-3,3	0,25(0,3)			
375	6,9-7,1	0,65-0,75	0,1(0,15			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in [ ]

Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever 1	Control rod travel mm 2	Rotational speed rev/min 3	Upper rated speed: Degree of deflection of control lever 4	Control rod travel mm 5	Rotational speed rev/min 6	Variations in control rod travel: 7	Rotational speed rev/min 8	Control rod travel mm 9
13-17 (1)	min.12,5	250		(7) 11,8-12,0	2200	(12)	100	min. 20,3
(2)	6,9-7,1	375	50	(8) 7,2-7,6	2500	(13)	1800	12,2-12,4
(3)	**	400		(9) -	-	(14)	1000	12,7-12,8
(4)	-	-		(10) 0 - 1,0	2950			
(5)	2,5	720-820		(11)		(6)	Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19) Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	Full-load speed regulation (8a) rev/min 3	Variations in fuel delivery (17) (18): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	Difference cm³/1000 strokes 8
2200	33,0-35,0 (32,0-36,0)	2500* RW 7,2-7,6	1800	33,0-35,0 (32,0-36,0)	100	min. 55,0	6,0 (12a)
			1000	32,0-33,0 (32,0-35,0)	375	6,5-7,5 (5,5-9,0)	1,0
					2500	13,0-17,0 (12,0-18,0)	1,5 (15) see point 8a
							2,5
							3,0 (16)

Checking values in brackets

* 1 mm less control rod travel than in Column 2

ca. 3,5 XXXXXXX

12.82

1. ** Set the idle auxiliary spring at n = 400 min^{-1} so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

   At 1000 min^{-1}, control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

   Control-lever position 47°. After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30°. Speed range 350 min^{-1} - 450 min^{-1}

4. Check the pneumatic shutoff box

   Control lever at idle stop.
   At n = 375 min^{-1} and pu = 450 mbar (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 10,0 o
2. Edition
En

Testoll-ISO 4113

PE 6 P 110 A 320 RS 3080 RQV 250-1100 PA 589

superseded 8.81
company Volvo
engine TD 100 GA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)= RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,2+0,1	16,7 - 16,9	0,4(0,8)			
250	4,0-4,2	1,6 - 2,0	0,3(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1180	15,2-17,8	-	-	-	ca. 8	100	min.5,6	200	0,6-0,9
ca. 63	11,2	1160-1170					250	4,0-4,2	600	5,4-6,4
	4,0	1225-1255					305-365=2,0mm		670-1040	6,4-6,6
	1350	0 - 1,0				③a			1100	7,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed ②b limitation intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
LDA	0,75 bar	1160-1170 *	LDA	0 bar	100	160,0-190,0		
700	167,0-169,0 (164,0-172,0)		700	121,0-125,0 (118,0-128,0)		/ 20,0-21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

A3

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel: diminution / increase mm (1)
.. LS 3080 + .. PA 589	0,54	0,75 0 0,34	11,8 - 11,9 12,2 - 12,3 9,7 - 9,9 10,5 - 10,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

A4

A4

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 15.8 e
2. Edition
En

Testoil-ISO 4113

PE 10 P 110 A 920/5 LS 3073 RQV 300-1250 PA 549
RQV 300-1250 PA 549-1

supersedes 82
company KHD
engine: BF 10 L 413 F
294 kW (400 PS) / 2500 min^{-1}

1 - 10- 9 - 4 - 3 - 6 - 5 - 8 - 7 - 2
0 - 27-72 -99 -144-171-216-243-288-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,1+0,1	14,8 - 15,2	0,4(0,8)			
300	6,3-6,5	1,1 - 1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

... PA 549 + .. PA 549-1

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1340	15,2-17,8	-	-	-	ca. 13 (3a)	100	min. 8,0	250	0,5-0,8
ca. 66	11,1	1290-1300					300	6,3-6,5	580	2,9-3,1
	4,0	1370-1400					320-500=2,0mm		920	4,8-5,0
	1500	0 - 1,0							1250	8,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1250	0,9 bar 148,0-152,0 (146,0-154,0)	1290-1300*	LDA 900	0,9 bar 143,0-147,0 (140,0-150,0)	100	130,0-150,0 / 13,0 - 13,2 mm RW	-	-
			LDA 500	0 bar 95,0- 97,0 (92,0-100,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

A5

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE10P..LS3073 + ..PA 549 + ..PA 549-1	0,9		12,1 - 12,2
		0	9,7 - 9,8
		0,55	11,1 - 11,2
		0,47	9,9 - 10,1

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

A6

A6

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 e
2. Edition
En

Testoil-ISO 4113

PE 12 P 110 A 920 LS 3060 RQV 300-1250 PA 479 KR

supersede 9.82
company: KHD
engine: BF 12 L 413 FC
386 kW - 2500 min⁻¹

1 - 4 - 9 - 8 - 5 - 2 - 11- 10- 3 - 6 - 7 - 12
0 - 45- 60-105-120-165-180-225-240-285-300-345° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,7+0,1	14,7 - 15,1	0,4 (0,8)			
300	6,7-6,9	1,6 - 2,2	0,7 (1,0)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1270	15,2-17,8	-	-	-	ca. 13	100	min. 8,3	250	0,2-0,6
ca. 60	10,7	1280-1290					300	6,7-6,9	580	3,4-3,7
	4,0	1385-1415							920	5,3-5,5
	1550	0 - 1,0				350-500			1250	8,3
						(3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA 1250	0,75 bar 147,0-151,0 (145,0-153,0)	1280-1290*	LDA 850	0,75 bar 122,0-126,0 (119,0-129,0)	100	140,0-160,0	1250	11,7+0,1
							850	11,0+0,1
			LDA 500	0 bar 78,0- 80,0) (74,0- 84,0)			500	10,1+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

A7

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

A7

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE 12 P..LS 3060 + ..PA 479 KR	0,35	0,75 0 0,22	10,1 - 10,3 10,4 - 10,5 9,0 - 9,2 9,6 - 9,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

A8

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD
2. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 920/5 LS 3073 RQV 300-1150 PA 549

1-10-9 - 4- 3 - 6 - 5 - 8 - 7 - 2
0-27-72-99-144-171-216-243-288-315 ° ±0,5 ° (±0,75 °)

supersedes 9.82
company: KHD
engine: BF 10L 413 F
265 kW (360 PS)
bei 2050 min -1
bzw. 259 kW (352 PS)
(Maxidyne)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,6+0,1	13,8-14,0	0,4(0,8)			
300	6,9-7,1	1,8 - 2,4	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1220	15,2-17,8	-	-	-	ca.12 (3a)	100 300 465-525	min.8,5 6,9-7,1 = 2,0	250 550 1150	
ca. 64	9,7 4,0 1400	1190-1200 1270-1300 0 - 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b): rev/min (4a) 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 138,0-140,0 (135,0-143,0)	1190-1200 *	LDA 500	0 bar 85,0-89,0 (82,0-92,0)	100	110,0-140,0	1150 1025 875 800	10,7+0,2 10,9+0,2 11,4+0,2 11,6+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

A9

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE 10 P..LS 3073 RQV.. PA 549	0,55	0,90 0 0,39	11,2-11,3 11,6-11,7 9,4-9,5 10,1-10,3

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

A10

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 RVI 8,8 d
3. Edition

En

Testoil-ISO 4113

PES 6 P 120 A 320 RS 419 Z RQV 250-1100 PA 540

superseded 10.81
company: RVI
engine: MIDR 06.20.3C
188 kW(256PS

1 - 5 - 3 - 6 - 2 - 4 je 60°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,75-2,95) 2,80-2,90 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	9,5-9,6	20,2 - 20,6	0,5(0,9)			
250	4,4-4,6	1,4 - 2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (7): rev/min 10	mm 11
max.	1270	15,2-17,8				ca.10	100	min. 6,0	2000	0,8-1,0
							250	4,4-4,6	5003	3,5-3,6
									8004	4,8-4,9
ca.61	8,5	1140-1150							1100	6,9
	4,0	1215-1245				280-400				
	1350	0 - 1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1100	0,7 bar 202,0-206,0 (199,0-209,0)	1140-1150*	LDA 1100	0 bar 142,0-146,0 (139,0-149,0)				

Checking values in brackets

* 1 mm less control rod travel then col. 2

1.83

A11

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 P..RS 419Z + RQV..PA 540	0,26		9,0 - 9,1
		0,70	9,5 - 9,6
		0	7,4 - 7,5
		0,21	7,9 - 8,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

(1A) WPP 001/4 KHD 1g9

1. Edition:

40

En

PES 6 MW 100/720 RS 1013
RSV 325...1100 MW 8/310
komb. Nr.: 0 403 476 010

supersedes 5.81
company: KHD
engine: BF 6 L 413 FR
Tractor DX 230
147 KW bei 2200 min^{-1}

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,10 - 3,20 (3,05 - 3,25) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,8$^{+0,1}$	10,6 - 10,8	0,35(0,6)			
325	5,6-5,8	1,25- 1,65	0,35(0,55)			
900	12,4+0,1		0,5 (0,7)			
500	10,6+0,1		0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0		ca. 18	325	5,2	1100	11,8-11,9
					100	min. 19	900	12,4-12,5
ca. 50 (2a)	1140-1150 = 10,8 1155-1185 = 4,0 1360 = 0,3-1,7				325 550-610	5,6-5,8 2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note: changed to) rev/min 3	(3a) Fuel delivery charactenstics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA 1100	0,55 bar 106,0-108,0 (104,0-110,0)	1140-1150*	LDA 900	0,55 bar 114,5-118,5 (112,5-120,5)	100	min. 120	325	5,7
					325	12,5-16,5 (10,0-19,0)		
			LDA 500	0 bar 82,5-84,5 (80,5-86,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.82

A13

A13

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
RS 1013 + MW 8/310		0,4 0,55	11,9 - 12,0 11,1 - 11,2

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 DEE 7,6 a
1. Edition

En

PES 6 P 110 A 720 RS 361 RSV 400-1050 P2/478

supersedes: John Deere
company: 6466 AR-06
engine: 167 kW (227 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,75-2,85 (2,70-2,90) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,5 +0,1	15,0-15,2	0,4 (0,8)			
400	6,2-6,3	1,2-1,8	0,4 (0,8)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800 X =	0,3-1,0	-	-	-	ca.20	400	5,7	1050	11,5-11,6
							100	min.19,0	650	12,3-12,4
ca.44 (2a)	10,5 4,0 1280	1105-1115 1185-1215 0,3 -1,7					400 570-630 800	6,1-6,3 = 2,0 max. 1,0	500	8,4-8,5

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note: changed to ..) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes 7	(5) (4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA 1050	0,65 bar 150,0-152,0 (147,0-155,0)	1105-1115*	LDA 650	0,66 bar 162,0-166,0 (159,0-169,0)	100	155,0-175,0	400	6,2
			LDA 500	0 bar 74,0-80,0 (71,0- 83,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

A15

A15

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PES 6 P..RS 361 +RSV..P2/478	0,67	0,36	11,5-11,6 9,8- 9,9

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

n A16

PE10P110A920/5 LS 3073 RQ300/1150PA535

superseded 9.82

company: BF10L413F

engine: 265kW (360 PS) / 2050 min^{-1} bzw. 259 kW (352 PS) / 2300 min^{-1} (Maxidyne)

1-10- 9- 4- 3 - 6 - 5 - 8 - 7 - 2

0-27-72-99-144-171-216-243-288-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,6+0,1	13,8-14,0	0,4(0,8)			
300	6,9-7,1	1,8-2,4	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation				Idle speed regulation				Torque control ③	
		Setting point		Test specifications ④		Setting point		Test specifications ⑤			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
700	19,2-20,9	700	20,0	9,7	1195-1205	300	7,0	100	min.8,5	1150	10,7-10,9
				4,0	1220-1250			300	6,9-7,1	800	11,6-11,7
VH=	max.46°									1020	11,5-11,7
				1350	0-1,0			340-380	= 2,0	1050	11,2-11,4

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA 800	0,9 bar 138,0-140,0 (135,0-143,0)	-	LDA 500	0 bar 85,0-89,0 (82,0-92,0)	100	115,0-140,0

Checking values in brackets

1.83

A17

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE10P..LS3073 + .. PA535	0,55	0,90	11,2-11,3 11,6-11,7
		0	9,4-9,5
		0,39	10,1-10,3

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 DAF 11,6 n 3
1. Edition
En

PE 6 P 110 A 320 RS 407-1 RQ 250/1100 PA 428/2 R

supersedes –
company: DAF
engine: DKTL 1160

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	12,3+0,1	13,9-14,1	0,4 (0,8)			
250	7,1-7,3	1,1-1,5	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	11,3 4,0 1350	1145-1160 1200-1230 0 - 1,0	250	7,2	100 250 345-385	min. 7,3 7,1-7,3 = 2,0	850 1100	12,3+0,1 12,2+0,2

Torque-control travel / on flyweight assembly dimension a = mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA 850	0,5 bar 139,0-141,0 (136,0-144,0)	-	LDA 600	0 bar 135,0-138,0 (132,0-141,0)	100	245,0-285,0 = 19,5-21,0 mm RW

Checking values in brackets

12.82

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 600 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE6P..RS407-1 + RQ..PA 428/2R	0,30		12,1 - 12,2
		0,50	12,3 - 12,4
		0	12,0 - 12,1

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 SCA 11,0 r 5
2. Edition
En

Testoil-ISO 4113

PE 6 P 110 A 720 RS 3040 RQV 250-1000 PA 555

supersedes 8.81
company: Scania
engine: DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,3 - 3,4 (3,25-3,45) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	13,6+0,1	17,1 - 17,3	0,4(0,8)			
225	4,2-4,4	0,9 - 1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1050 1300	15,2-17,8 0 - 1,0	-	-	-	ca. 9	100 225	min.5,7 4,2-4,4	200 470 730 1000	1,0-1,2 3,5-3,9 5,2-5,4 8,0
ca.60	12,6 4,0	1040-1050 1140-1170				250-355 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1000	0,7 bar 171,0-173,0 (168,0-176,0)	1040-1050 *	LDA 600 LDA 500	0,7 bar 168,0-171,0 (165,0-174,0) 0 bar 127,0-131,0 (124,0-134,0)	100	220,0-270,0 20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

A21

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing XXXXXXX pressure - in bar gauge pressure

SCA 11,0 r 5

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel XXXXXX diminution / XXXXXXX difference mm (1)
.. RS 3040 + .. PA 555	0,7		13,6 - 13,7
		0,41	13,1 - 13,3
		0,26	12,3 - 12,4
		0	11,9 - 12,0

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f 4
1. Edition

En

PE6P120A320RS3071Z. RQV 250-1025 PA 371

supersedes..
company: Volvo
engine: TD 120 G/USA
243 kW (330 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6-2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4+0,1	20,6-20,9	0,5(0,9)			
250	5,3-5,5	2,2 - 2,6	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 12	100	min.7,0	200	0,7-0,9
ca. 42	10,4	1065-1075					250	5,3-5,5	475	2,8-3,1
	4,0	1145-1175					310-360	=2,0	750	4,8-5,1
	1300	0 -1,0							1025	7,2
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm 9
LDA	0,9 bar	1065-1075*	LDA	0 bar	100	240,0-280,0	-	-
700	206,0-209,0		700	176,0-180,0		=RW 20,0		
	(203,0-212,0)			(173,0-183,0)		21,0 mm		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

A23

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/mn decreasing / increasing pressure – in bar gauge pressure

VOL 12,0 f 4

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE6P..RS3071Z + RQV.. PA 371	0,45	0,90 0 0,28	11,0-11,1 11,4-11,5 9,7- 9,8 10,1-10,3

Notes:

(1) when n = rev/mn and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 b 1
1. Edition

En

Testoil-ISO 4113

PES 6 MW 100/320 RS 1107
RQV 350-1200 MW 43

0 403 446 135

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes -
company IHC - USA
engine DTC 466 B
121,3 kW (165 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10 (3,95-4,15) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,1+0,1	8,4 - 8,6	0,35(0,6)			
350	5,9-6,1	1,6 - 2,0	0,35(0,55)			
1200	11,1+0,1		0,65(0,7)			
500	9,8+0,1					

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3 (1a) (2a)	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6 (4)	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9 (3)	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0	1355-1395	-	-	-	ca. 14	100	min.9,0		
	0 - 1	1450					350	5,9-6,1		
ca.60,5	4,0	1365-1375				370-650 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery, Control-rod stop, Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b), intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a), high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6), idle, switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 84,0-86,0 (82,0-88,0)		LDA 1200	0,9 bar 86,5-90,5 (84,5-92,5)	100	19,0-21,0 mm RW		
			LDA 500	0 bar 61,5-63,5 (59,5-65,5)		140-180 220-280(210-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

B1

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

IHC 7,6 b 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1107 RQV .. MW 43	0,3	0,9 0 0,13	10,8 - 10,9 11,1 - 11,2 9,8 - 9,9 10,1 -10,2

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

B2

B2

Test Specifications Fuel Injection Pumps (1) and Governors

WPP 001/4 IHC 7,5 a 1
1. Edition

En

PES 6 MW 100/320 RS 1103

RQV 350-1300 MW 43

0 403 446 131

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes
company IHC
engine DT 466 B
154,5 kW (210 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10 (3,95-4,15) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,9+0,1	10,3 - 10,5	0,35(0,6			
350	6,0-6,2	1,6 - 2,0	0,35(0,5			
1300	11,9+0,1		0,65(0,7			
500	9,6+0,1					

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0	1440-1505	-	-	-	ca. 14	100	min.9,0		
	0 - 1	1600					350	6,0-6,2		
ca.62,5						370-650				
	4,0	1475-1485				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,9 bar		LDA	0,9 bar				
900	103,0-105,0		1300	107,0-111,0	100	19 - 21		
	(101,0-107,0)			(105,0-113,0)		mm RW		
			LDA	0 bar		140 - 180		
			500	63,5-65,5				
				(61,5-67,5)		220-280(210-290)		

Checking values in brackets

* 1 mm less control rod travel than col 2

12.82

B3

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

B3

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

IHC 7,6 a 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1103 + RQV .. MW 43	0,51	0,9 0 0,28	11,3 - 11,4 11,9 - 12,0 9,6 - 9,7 10,4 - 10,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 C
1. Edition
En

PES 6 MW 100/320 RS 1103
RQV 350-1300 MW 43-1
0 403 446 132

supersedes_
company: IHC-USA
engine: DT 466 B
143,4 kW (195 PS)

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10 (3,95-4,15) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	12,9+0,1	9,55-9,75	0,35(0,6)			
350	5,7-5,8	1,6 - 2,0	0,35(0,55)			
1300	10,9+0,1		0,65(0,7)			
500	9,4-9,4					

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0 0-1	1355-1395 1500	-	-	-	ca. 13	100 350	min. 9,0 5,8 - 6,0		
ca.61,5	4,0	1457-1467			360-700	(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 900	0,9 bar 95,5-97,5 (93,5-99,5)		LDA 1300 LDA 500	0,9 bar 96,5-100,5 (94,5-102,5) 0 bar 63,5-65,5 (61,5-67,5)	100 220-280	19-21 mm RW 140-180 (210-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

B5

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

B5

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

IHC 7,6 c

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1103 + RQV..MW 43-1	0,4		10,5 - 10,6
		0,9	10,9 - 11,0
		0	9,4 - 9,5
		0,19	9,8 - 9,9

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

B6

B6

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 e

En 1 Edition

PES 6 MW 100/320 RS 1108
RQV 350-1200 MW 43-3
0 403 446 137

supersedes
company IHC-USA
engine DT 466 B
132,4 kW (180 PS)

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW=9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,5+0,1	9,05-9,25	0,35(0,6)			
350	6,2-6,3	1,6-2,0	0,35(0,55)			
1200	11,5+0,1		0,65(0,7)			
500	10,0+0,1					

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0	1360-1400	-	-	-	ca. 17	100	min. 9,0		
	0,1	1450					350	6,2-6,3		
ca.60,5						370-650				
	4,0	1380-1390				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,9 bar		LDA	0,9 bar				
800	90,5-92,5 (88,5-94,5		1200	93,0-97,0 (91,0-99,0)	100	19-21 mm RW 140,0-180,0		
			LDA 500	0 bar 60,0-62,0 (58,0-64,0)	220-280(210-290)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

B7

BOSCH Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung.
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

B7

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

IHC 7,6 e

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1108 + RQV.. MW 43-3	0,42	0,9 0 0,19	11,1 - 11,2 11,5 - 11,6 10,0 - 10,1 10,3 - 10,4

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

B8

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 IHC 7.6. f
1. Edition
En

PES 6 MW 100/320 RS 1108
RQV 350-1300 MW 43-4
0 403 446 138

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes
company IHC
engine DT 466 B
154,5 kW (210 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	12,6-0,1	10,7-10,9	0,35(0,6)			
350	6,5-6,6	1,6-2,0	0,35(0,55)			
1300	12,6+0,1		0,65(0,7)			
500	9,6+0,1					

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0	1440-1505	-	-	-	ca. 16	100	min.9,0		
	0-1	1580					350	6,1-6,2		
ca.61,5	4,0	1500-1510				370-650 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 900	0,9 bar 107,0-109,0 (105,0-111,0)		LDA 1300	0,9 bar 112,5-116,5 (110,5-118,5)	100	19-21 mm RW		
			LDA 500	0 bar 53,5-55,5 (51,5-57,5)		140-180 220-280(210-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

B9

BOSCH Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung.

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

IHC 7,6 f

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
RS 1108 + RQV .. MW 43-4	0,57	0,9 0 0,27	11,9 -12,0 12,6 -12,7 9, 6-9,7 10,4 -10,5

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6d
1. Edition
En

PES 6 MW 100/320 RS 1107
RQV 350-1200 MW 43-2
0 403 446 136

supersedes -
company: IHC-USA
engine: DT 466 B
132,4 kW (180 PS)

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10 (3,95-4,15) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,8+0,1	9,45-9,65	0,35 (0,6			
350	5,9-6,1	1,6 - 2,0	0,35 (0,5			
1200	11,8-11,9		0,65 (0,7			
500	10,4-10,5					

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0 0-1	1355-1395 1500	-	-	-	ca.15	100 350	min.9,0 5,9-6,1		
ca.61,5	4,0	1375-1385				370-650 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 94,5-96,5 (92,5-98,5)		LDA 1200 LDA 500	0,9 bar 96,5-100,0 (94,0-102,0) 0 bar 70,0-72,0 (68,0-74,0)	100 220-280	19,0-21,0 mm RW 140-180 (210-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

B11

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1107 RQV..MW 43-2	0,39		11,5 - 11,6
		0	10,4 - 10,5
		0,9	11,8 - 11,9
		0,17	10,7 - 10,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

B12

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 g
En 1. Edition

PES 6 MW 100/320 RS 1108
RQV 350-1200 MW 43-5
0 403 446 139

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes
company: IHC
engine: DT 466 B
121,4 kW (165 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,6+0,1	8,5-8,7	0,35(0,6)			
350	5,8-5,9	1,6-2,0	0,35(0,55)			
1200	10,6+0,1		0,65(0,7)			
500	9,2-9,3					

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	8,0	1360-1400	-	-	-	ca.14	100	min.9,0		
	0-1	1460					350	5,8-5,9		
ca.58,5	4,0	1360-1370				360-640 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 85,0-87,0 (83,0-89,0)		LDA 1200	0,9 bar 90,5-94,5 (88,5-96,5)	100	19-21 mm RW 140-180		
			LDA 500	0 bar 59,0-61,0 (57,0-63,0)		220-280 (210-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung.

B13

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
RS 1108 RQV.. MW 43-5	0,42		10,2 - 10,3
		0,9	10,6 - 10,7
		0	9,2 - 9,3
		0,18	9,5 - 9,6

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than n = 500 min^{-1}.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 3,0 p
2. Edition
En

Testoil-ISO 4113

PES 5 M 55 C 320 RS 108
RSF 350/2300 M 16
Komb. Nr. 0 400 075 994 ! Sales model 0 400 075 993

supersedes 2.81
company Daimler Benz
engine OM 617
65 KW (88 PS)

1-2 - 4 - 5 -3
0-72-144-216-288 + 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm (from BDC) 20 mm Control rod travel

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (compensating valve) mm 6
1000	13,9 +0,1	3,9-4,0	0,25(0,3)			
350	6,5-6,7	0,6-0,7	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in ☐ Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever 1		Control rod travel mm 2	Rotational speed rev/min 3	Upper rated speed: Degree of deflection of control lever 4		Control rod travel mm 5	Rotational speed rev/min 6	Variations in control rod travel 7	Rotational speed rev/min 8	Control rod travel mm 9
9-13	(1)	min.10,5	250	50	(7)	13,0-13,2	2200	(12)	100	min.20,3
	(2)	max.10,0	300		(8)	9,1-9,5	2500	(13)	1800	13,5-13,7
	(3)	6,5-6,7	350		(9)	-	-	(14)	1000	13,9-14,0
	(4)	**	385		(10)	0-1,0	2950			
	(5)	-	-		(11)			(6)	Switching point	
		2,5	720-820							

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19) Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	Full-load speed regulation (8a) rev/min 3	Variations in fuel delivery (17) (18) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle rev/min 6	cm³/1000 strokes 7	Difference cm³/1000 strokes 8
2200	39,5-41,5 (38,5-42,5)	2500 * RW 9,1-9,5	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 (12a)
			1000	39,0-40,0 (38,0-41,0)	350	6,0-7,0 (5,5-9,0)	1,0
							1,5 (15)
					2500	23,0-27,0 (22,0-28,0)	2,5 see
							3,0 point 8a (16)

Checking values in brackets

ca. 4,0 mm control rod travel than in Column 2

12.82

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung

1. ** Set the idle auxiliary spring at n = 385 min^{-1} so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

   At 1000 min^{-1}, control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

   Control-lever position 47°. After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30°. Speed range 350 min^{-1} - 450 min^{-1}

4. Check the pneumatic shutoff box

   Control lever at idle stop.
   At n = 375 min^{-1} and pu = 450 mbar (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 3,0 o
2. Edition
En

PES 5 M 55 c 320 RS 108
RSF 350/2300 M 15
Komb.Nr. 0 400 075 995 Sales model 0 400 075 992
1-2 -4 -5 -3
0-72-144-216-288

supersedes 1.81
company Daimler-Benz
engine OM 617

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm (from BDC)

Control rod travel 20 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (compensating valve) mm 6
1000	13,9 +0,1	3,9-4,0	0,25(0,3)			
350	6,5-6,7	0,6-0,7	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in ☐ Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever 1		Control rod travel mm 2	Rotational speed rev/min 3	Upper rated speed: Degree of deflection of control lever 4		Control rod travel mm 5	Rotational speed rev/min 6	Variations in control rod travel 7	Rotational speed rev/min 8	Control rod travel mm 9
9-13	(1)	min.10,5	250	50	(7)	13,0-13,2	2200	(12)	100	min.20,3
	(2)	max.10,0	300		(8)	9,1-9,5	2500	(13)	1800	13,5-13,7
	(3)	6,5-6,7	350		(9)	-	-	(14)	1000	13,9-14,0
	(4)	**	385		(10)	0,1,0	2950			
	(5)	2,5	720-820		(11)	-	-	(6)	Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19) Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	Full-load speed regulation (8a) rev/min 3	Variations in fuel delivery (17) (18) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle rev/min 6	cm³/1000 strokes 7	Difference cm³/1000 strokes 8
2200	39,5-41,5 (38,5-42,5)	2500* RW=9,1-9,5	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 (12a)
			1000	39,0-40,0 (38,0-41,0)	350	6,0-7,0 (5,5-9,0)	1,0 (1,5) see (15)
					2500	23,0-27,0 (22,0-28,0)	2,5 point 8a (16)

Checking values in brackets

* 1 mm less control rod travel than in Column 2

ca. 4,0xxx

12.82

B17

1. ** Set the idle auxiliary spring at n = 385 min^{-1} so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

   At 1000 min^{-1}, control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

   Control-lever position 47°. After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30°. Speed range 350 min^{-1} - 450 min^{-1}

4. Check the pneumatic shutoff box

   Control lever at idle stop.
   At n = 375 min^{-1} and pu = 450 mbar (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,0 h
2. Edition
En

PES 4 M 50 C 320 RS 103
RSF 375/2250 M 20
Komb. Nr. 0 400 074 976
1-3-4-2=0 - 90-180-270 +0,5 (0,75)°

Sales model
0 400 074 975

superseded 10.81
company Daimler Benz
engine OM 615
42,7 kW (58 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke: 1,70 - 1,80 (1,65 - 1,85) mm (from BDC)

20mm Control rod travel

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (compensating valve) mm 6
1000	11,9+0,1	2,95-3,05	0,25(0,3)			
375	6,9-7,1	0,65-0,75	0,10(0,15)			

Set uniform delivery according to the values in [ ]

Checking values in brackets

B. Governor Settings

Lower rated speed: Degree of deflection of control lever 1	Control rod travel mm 2	Rotational speed rev/min 3	Upper rated speed: Degree of deflection of control lever 4	Control rod travel mm 5	Rotational speed rev/min 6	Variations in control rod travel 7	Rotational speed rev/min 8	Control rod travel mm 9
13-17 ①	min.12,5	250	50 ⑦	11,2-11,4	2200	⑫	100	min. 20,3
②	6,9-7,1	375	⑧	8,1-8,5	2500	⑬	1900	11,4-11,6
③	**	400	⑨	-	-	⑭	1000	11,9-12,0
④	- -	-	⑩	0,0-1,0	2950			
⑤	2,5	720-820	⑪	-	-	⑥	Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery ⑲ Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	Full-load speed regulation ⑧a rev/min 3	Variations in fuel delivery ⑰ ⑱ rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle rev/min 6	cm³/1000 strokes 7	Difference cm³/1000 strokes 8
2200	31,5-33,5 (30,5-34,5)	2500* RW 8,1-8,5	1900	32,0-34,0 (31,0-35,0)	100	min. 55,0	6,0 ⑫a
					375	6,5-7,5 (5,5-9,0)	1,0
			1000	29,5-30,5 (28,5-31,5)			1,5
					2500	17,0-21,0 (16,0-22,0)	2,5 see ⑮ 3,0 point 8a
							⑯

Checking values in brackets

* 1 rpm less control rod travel than in Column 2

3,0

12.82

1. ** Set the idle auxiliary spring at n = 400 min^{-1} so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

   At 1000 min^{-1}, control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

   Control-lever position 47°. After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30°. Speed range 350 min^{-1} - 450 min^{-1}

4. Check the pneumatic shutoff box

   Control lever at idle stop.
   At n = 375 min^{-1} and pu = 450 mbar (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,4 m
3. Edition

En

PES 4 M 55 c 320 RS 107
RSF 375/2250 M 17

superseded 9.81
company Daimler-Benz
engine OM 616
53 kW (72 PS)

Komb.Nr. 0 400 074 982 : Sales model 0 400 074 980

1-3 - 4 - 2
0-90-180-270

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm (from BDC) 20 mm Control rod travel

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (compensating valve) mm 6
1000	$13,9^{+0,1}$	3,9-4,0	0,25(0,3)			
375	6,5-6,7	0,6-0,7	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in ☐ Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever 1	Control rod travel mm 2	Rotational speed rev/min 3	Degree of deflection of control lever 4	Control rod travel mm 5	Rotational speed rev/min 6		Rotational speed rev/min 8	Control rod travel mm 9
9-13 (1)	min.11,5	250	50 (7)	13,0-13,2	2200	(12)	100	min.20,3
(2)	max.11,0	300	(8)	8,7-9,1	2500	(13)	1800	13,3-13,5
(3)	6,5-6,7	375	(9)	-	-	(14)	1000	13,9-14,0
(4)	**	400	(10)	0-1,0	2950			
(5)	-	-						
	2,5	720-820	(11)	-	-	(6)	Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19) Test oil temp 40°C (104°F)		Full-load speed regulation (8a)	Variations in fuel delivery (17) (18)		Starting fuel delivery Idle		
							Difference
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	cm³/1000 strokes 8
2200	39,5-41,5 (38,5-42,5)	2500 * RW 8,7-9,1	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 (12a)
			1000	39,0-40,0 (38,0-41,0)	375	6,0-7,0 (5,5-9,0)	1,0
					2500	23,0-27,0 (22,0-28,0)	1,5 see (15) point 8a 2,5 3,0 (16)

Checking values in brackets

Cd. 4,2xxxx

12.82

1. ** Set the idle auxiliary spring at n = 400 min^{-1} so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

   At 1090 min^{-1}, control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

   Control-lever position 47°. After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30°. Speed range 350 min^{-1} - 450 min^{-1}

4. Check the pneumatic shutoff box

   Control lever at idle stop.
   At n = 375 min^{-1} and pu = 450 mbar (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

En bel

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,4 L
3. Edition
En

PES 4 M 55 C 320 RS 107
RSF 375/2250 M 18
Komb. Nr. 0 400 074 981 : Sales model 0 400 074 979

supersedes 9.81
company Daimler Benz
engine OM 616
53 kW (72 PS)

1- 3- 4 - 2
0-90-180-270

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 (2,15-2,35) mm (from BDC) Control rod travel 20mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (compensating valve) mm 6
1000	13,9 +0,1	3,9-4,0	0,25(0,30)			
375	6,5-6,7	0,6-0,7	0,1(0,15			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in ☐ Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever 1	Control rod travel mm 2	Rotational speed rev/min 3	Degree of deflection of control lever 4	Control rod travel mm 5	Rotational speed rev/min 6	7	Rotational speed rev/min 8	Control rod travel mm 9
9-13 (1)	min.11,5	250	50 (7)	13,0-13,2	2200	(12)	100	min.20,3
(2)	max.11,0	300	(8)	8,7-9,1	2500	(13)	1800	13,3-13,5
(3)	6,5-6,7	375	(9)	-	-	(14)	1000	13,9-14,0
(4)	**	400	(10)	0 - 1,0	2950			
(5)	-	-	(11)					
	2,5	720-820				(6)	Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19) Test oil temp 40°C (104°F)		Full-load speed regulation (8a)	Variations in fuel delivery (17) (18)		Starting fuel delivery Idle		Difference
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	cm³/1000 strokes 8
2200	39,5-41,5 (38,5-42,5)	2500* RW 8,7-9,1	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 (12a)
			1000	39,0-40,0) (38,0-41,0)	375	6,0-7,0 (5,5-9,0)	1,0
							1,5
					2500	23,0-27,0 (22,0-28,0)	2,5 see (15)
							3,0 point 8a (16)

Checking values in brackets

ca. 4,2 mm less control rod travel than in Column 2 XXXXX

12.82

B23

1. ** Set the idle auxiliary spring at n = 400 min^{-1} so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

   At 1000 min^{-1}, control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

   Control-lever position 47°. After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30°. Speed range 350 min^{-1} - 450 min^{-1}

4. Check the pneumatic shutoff box

   Control lever at idle stop.
   At n = 375 min^{-1} and pu = 450 mbar (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

(1) WPP 001/4 PER 10,0 o

1. Edition En

PES 8 MW 100/720 RS 1021 RQV 275-1125 MW 40
0 403 448 115

supersedes
company: Perkins
engine: V8.640 GR
148 kW (201 PS)

1 - 8 - 7 - 5 - 4 - 3 - 6 - 2
0 - 45 - 90 - 135 - 180 - 225 - 270 - 315 ± 0,50 (0,75)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00 - 3,10 (2,95 - 3,15) mm (from BDC) RW = 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,7+0,1	9,05 - 9,25	0,35(0,6)			
275	6,2-6,4	1,35 - 1,75	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1190 1350	15,2-17,8 0 - 1,0	-	-	-	ca. 11	275 100 min.	6,2-6,4 7,7		
ca. 62	9,7 4,0	1175-1185 1220-1250				300-500 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
800	90,5 - 92,5 (88,5 - 94,5)	1175-1185*			100	min. 140,0 100-195 (80-215)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

C1

11.82

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

B1

PER 10,0 o

Port closing and TDC markings:

Comb. - No.	°camshaft between port-closing and TDC at control-rod travel 9,0 - 12,0 mm
... 115	15°

Test Specifications Fuel Injection Pumps and Governors

WPP 00 1/4 MB 3,0 m

2. Edition En

PES 5 MW 55/320 RS 16
RW 375/2200 MW 28-1
0 403 245 013
0 403 245 014 - Sales model

supersedes 2.80
company Daimler Benz
engine OM 617 A

Caution: Read important information on back before beginning testing.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,10-2,20 mm (from BDC) 21mm Control rod travel

Without ALDA (2,05-2,25)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm³/100 strokes	cm³/100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1000	13,5+0,1	5,15 - 5,25	0,25(0,3)			
375	5,2-5,3	0,6 - 0,7	0,10(0,15)			
1600			0,25(0,3)			
2180			0,25(0,3)			

Set uniform delivery according to the values in ☐ Checking values in brackets

B. Governor Settings

Without ALDA

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel	Rotational speed	Degree of deflection of control lever	Control rod travel	Rotational speed		Rotational speed	Control rod travel
	mm	rev/min		mm	rev/min		rev/min	mm
1	2	3	4	5	6	7	8	9
27-31 ①	min.11	100	69 ⑦	12,1-12,3	2180	⑫	100	20,5-21,5
②	max.11	320	⑧			⑬		
③	5,2-5,3	375	⑨	11,0	2300-2320	⑭	500	13,1-13,3
④	**	-	⑩	4,0	2620-2720		1000	13,5-13,6
⑤	-	-	⑪	0,0-1,0	2950	⑥	Switching point	
				-	-		260-310(240-330)	

C. Settings for Fuel Injection Pump with Governor Mounted

Without ALDA

Full-load delivery ⑲ Test oil temp 40°C (104°F)		Full-load speed regulation ⑧a	Variations in fuel delivery ⑰ ⑱		Starting fuel delivery idle		
							Difference
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	cm³/1000 strokes
1	2	3	4	5	6	7	8
2180	50,0-52,0 (49,0-53,0)	2300-2320* (2290-2330)	1600	51,5-53,0 (50,5-54,5)	100	min. 55,0	6,0 ⑫a
			1000	51,5-52,5 (50,5-53,5)	375	6,0 - 7,0 (5,5 - 9,5)	1,0 (1,5) ⑮
					2550	24,0-30,0 (23,0-31,0)	2,5 (3,0) ⑯

Checking values in brackets

* 1 mm less control rod travel than in Column 2

11.82

Testing with ALDA

MB 3.0 n

Point	min^{-1}	cm^3/1000 H	RW	Pressure (absolute)
18	1000	51,5 - 52,5 (50,5 - 53,5)	13,5 - 13,6	1733 mbar(1300 mmHg)
18a	*** 1000	41,0 - 43,0 (40,0 - 44,0)	-	1067 mbar(800 mmHg)
19	2180	50,0 - 52,0 (49,0 - 53,0)	12,1 - 12,3	1733 mbar (1300 mmHg)
12a	100	min. 55	20,5 - 21,5	1733 mbar (1300 mmHg)
15	375	6.0 - 7.0 (5.5 - 9.5)	5,2 - 5,3	987 mbar (740 mmHg)

1. Adjusting the idle

Test supersedes Section 4.1 of test instructions VDT-W-420/300 Suppl. 2, Ed. 2.

Set the control lever to an angle of 69^0. Operate the fuel-injection pump at 1000 min^{-1}.
Screw in the spring retainer until a control-rod travel of 13,5 - 13,6 mm is reached.

Set the control lever to an angle of 49^0. Operate the fuel-injection pump at 1000 min^{-1}. Control-rod travel 8,8 - 9,5 must be reached.

2. Adjusting the lower rated speed

Text supersedes Section 4.3 of test instructions VDT-W 420/300 Suppl. 2, Ed. 2.

Operate the fuel-injection pump at n = 800 min^{-1}. Take back the control lever until a control-rod travel of 1.0 - 1.3 mm is reached.

The resulting deflection of the control lever must be within the allowable tolerance. Fix the control lever in this position. Drive the fuel-injection pump at a speed according to Point 2 Section B of the test specification sheet. Set regulation at adjusting screw (28).

3. Adjusting the idle-speed auxiliary spring (70)

** Position the idle-speed auxiliary spring in contact as the characteristic curve levels off at n=520-550 min^{-1}.

4. Adjusting the sensing lever

Place the control lever against the full-load stop.
Operate the fuel-injection pump at n = 375 min^{-1}. Adjust the sensing lever so that the control-rod travel is 0.1 (0.1 - 0.2) mm above the full-load control-rod travel at n = 1000^{-1}.

5. *** Correct the quantity of fuel injected at the correction screw of the ALDA aneroid box. Max. correction $\pm$ 0.75 mm control-rod travel.

6. Pin projection = 16.65 $\pm$ 0.1 mm

7. Shutoff check: Operate the fuel-injection pump at n = 200 min^{-1}. Force the control rod through the spring-loaded idle stop. The resulting control-rod travel must be max. 5 mm.

8. Test the pneumatic shutoff: Control lever in idle position. Operate the fuel-injection pump at n = 375 min^{-1}. At 450 mbar (338 mmHg) (vacuum) the control rod must move briskly to control-rod travel 0 mm.

9. Control-lever range idle - full load = 38 - 42°.

C5

En C5

Test Specifications Fuel Injection Pumps ① and Governors

WPP 061/4 RVI 9,8 b 1

En

1. Edition

PE 6 P 120 A 321 RS 438 RQV 275-1200 PA 648

supersedes

company: RVI

engine: MID 062045

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	11,2+0,1	13,4-13,7	0,5(0,9)			
275	5,3-5,5	0,7-1,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1230	15,2-17,8	-	-	-	ca. 11	100	min.6,9	250	0-0,9
							275	5,3-5,5	570	4,7-5,0
ca. 65	10,2	1240-1250							880	6,1-6,3
	4,0	1335-1365							1200	8,3
	1500	0-1,0				270-365 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1200	134,0-137,0 (131,0-140,0)	1240-1250*	-	-	100	180,0-200,0	-	-
					275	7,0-13,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

C6

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6v2

3. Edition

En

Testoil-ISO 4113

VE 4/9 F 1500 R 85-3

0 460 494 108

supersedes: 6.82
company: VWW
engine: 50 Hz-Aggr.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting -- mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1480	2,8-3,2	mm		
1.2 Supply pump pressure	1480	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1480	32,5-33,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0	cm³/1000 strokes		2,0 (3,0)
1.5 Start	100	min. 38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1550	12,0-18,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	--	--			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1480
	mm	1,3-2,1(1,0-2,4)	(2,3-3,7)
2.2 Supply pump	n = rev/min	600	
	bar (kgf/cm²)	2,8-3,4	
Overflow delivery	n = rev/min	600	1500
	cm³/10 s	55-138(40-153)	55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1630	max. 2,0		
	1550		(11,0-19,0)	
	1480		(30,7-35,3)	
	600	21,0-24,0	(19,5-25,5)	
switch-off	1500	0		
elect.	400	0		
Idle stop	600	max. 2,0		
	425		(4,0-12,0)	
End stop	400	min. 17,5		
	500	max. 23,0		

2.4 Solenoid: max. cut-in voltage xxx min. 10,0 V
xxxxxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max.2,5
+ FH	1,8-2,4
A XK	18,4-20,4
B XL	10,2-13,5

Observations

+ *operating stroke (KSB)

C7

C7

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 Ope 1,6 d
2. Edition
En

VE 4/9 F 2300 R 82
0 460 494 071

supersedes 6.82
company: Opel
engine: 2033-1,6 L

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,1-3,5	mm		
1.2 Supply pump pressure	1500	5,0-5,6	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	–	–	cm³/1000 strokes		
1.4 Idle speed regulation	450	6,0-10,0	cm³/1000 strokes		2,5(3,0)
1.5 Start	100	min. 42,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2640	17,0-23,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	1500	–			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1200	1500	2300
	mm	1,4-2,2(1,1-2,5)	(2,6-4,0)	6,8-7,6(6,5-7,9)
2.2 Supply pump	n = rev/min	600		2300
	bar (kgf/cm²)	2,4-3,0		7,3-7,9
Overflow delivery	n = rev/min	500		2300
	cm³/10 s	55-138 (40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	3000	max. 4,0		
	2800	7,0-13,0	(6,0-14,0)	
	2640		(16,0-24,0)	
	2300	27,2-29,6	(26,1-30,7)	
	2000	27,0-29,0	(25,7-30,3)	
	1500		(26,7-31,3)	
	600	23,2-26,2	(21,7-27,7)	
switch-off	2300	0		
Idle stop	1200	0		
	650	2,0-7,0	(0,5-8,5)	
	450		(4,0-12,0)	
End stop	400	min. 30		
	500	max. 28		

2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V max. holding voltage xxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,0
* FH	1,8-2,4
A XK	24,2-26,2
B XL	9,9-13,2

Observations

* *operating stroke (KSB)

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

12.82

C8

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 1 g 1

2. Edition

En

PES3A85D410/3 RS 2642 RSV325-1150A8B2102-1L

1 - 3 - 2 je 120° ±0,5° (± 0,75°)

supersedes: 6.82
company: KHD
engine: F3L 913
42 kW (57 PS)$_1$
2300 min
Tractor D 6007-S23

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,8+0,1	6,6-6,7	0,3 (0,45)			
325	8,9-9,1	1,7-2,3	0,2 (0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.20	325	8,5	1150	11,5+0,1
	X=						100	min.19,0	700	11,8+0,1
**							325	8,9-0,1	1075	11,6+0,3
(5) ca.54	10,2	1190-1200					485-545	=2,0		
	4,0	1265-1295								
	1350	0,3 -1,7								

** Set speed regulation before torque control.

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ... rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
700	66,0-67,0 (64,0-69,0)	1190-1200	1150	70,5-73,5 (68,5-75,5)	100	133,5-143,5	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

9.82

C9

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 PEN 12,0 d
1. Edition

En

PE 6 P 120 A 320 RS 3088 Z RSV 200-900 P4/421 R

supersedes -
company Volvo-Penta
engine TMD 120 B

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 - 2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,7+0,1	19,4-19,8	0,5 (0,9)			
250	3,6-3,8	1,6-2,0	0,5 (0,8)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,7	-	-	-	ca.22	250	3,2	-	-
	X = 4,0						100	min.20,0		
							250	3,6-3,8		
ca.53	10,7	940- 950					300-360	= 2,0		
(2a)	4,0	970-1000								
	1130	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ...) rev/min 3	(3a) Fuel delivery charactenstics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
700	194,0-198,0 (192,0-200,0)	940-950*	900	218,0-222,0 (215,0-225,0)	100	390-440 = 20,0-21,0 mmRW	250	3,7

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

C10

C10

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 k

2. Edition

En ;

PE 12A 95D 610LS 2453 RQV 300-1150 AB 1083 L

supersedes 9.82
company: KHD
engine: F 12 L 413 F
260 kW(352PS) bei 2300 min^{-1}

1 - 4 - 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12
0 -15 -60 -75 -120-135-180 -195 -240-255-300-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) / 2,00-2,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	9,5-9,6	8,8 - 9,0	0,3(0,6)			
300	6,4-6,6	1,6 - 2,2	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐.

Testoil-ISO 4113

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.16	100	min.8,0	300	1,4-1,6
							300	6,4-6,6	750	4,0-4,3
							640-700	=2,0	1190	8,5
ca.66	8,5	1190-1200								
	4,0	1240-1270				320-400 (3a)				
	1400	0 - 1,0								

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
1150	87,5 - 89,5 (85,5 - 91,5)	1190-1200*	1000	87,0-90,0 (85,0-92,0)	100	120 - 130 bei 14,3 - 14,7 mm RW	1100	9,5-9,6
							945	9,5-9,8
			700	88,0-91,0 (85,0-92,0)			800	9,8-10,0
							700	9,9-10,0
					100-220 (80-240)		400	9,9-10,0

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

C11

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 6,1 i

En 3. Edition

Testoil-ISO 4113

PES 6 A 85 D 410/3 RS 2415 RQV 300-1250 AB 1131 L

supersedes 9.82
company: KHD
engine: BF 6 L 913 T
96 kW bei 2500 min^{-1}

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9-2,0 (1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,0+0,1	7,8 - 7,9	0,3(0,45)			
300	8,4-8,6	0,9 - 1,5	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1385	15,2-17,8	-	-	-	ca. 17	100	min.10,0	250	0,9-1,1
							300	8,4-8,6	580	3,9-4,1
ca. 65	11,0	1290-1300							920	5,4-5,6
	4,0	1415-1445							1250	7,8
	1525	0-1,0					645-705=2,0			
						450-550 (3a)				

Torque control travel a = 0,9 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1250	78,0 - 79,0 (76,0 - 81,0)	1290-1300 *	800	69,5-71,5 (67,5-73,5)	100	105,0-115,0 bei 17,4-17,6 mm RW	1250	12,0+0,1
							3600	12,8+0,1
							850	12,3+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

C12

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

C12

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SSC 38,1 a
1. Edition

En

PE 12 P 110 A 520/6 LS 3090-1 RQV 300-750 PA 614

supersedes

company SSCM

engine: POYAUD V 12-150

1 - 8 - 5- 10 - 3 - 7 - 6 - 11 - 2 - 9 - 4 - 12
0 -37,5- 60-97,5-120-157,5-180-217,5-240-277,5-300-337,5° ± 0,5° (± 0,75°)

530 kW (720 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	13,3+0,1	24,6-24,9	0,4 (0,8			
300	4,7-4,9	1,8-2,4	0,4 (0,7			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	780	15,2-17,8	-	-	-	ca.10	100	min.6,3	250	0,2-0,6
							300	4,7-4,9	420	3,4-3,7
ca.66	12,3	790-800					325-385=2,0		580	5,2-5,4
	4,0	835-865							750	8,0
	1000	0-1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
750	246,0-249,0 (243,0-252,0)	790-800*	-	-	100	19,5-21,0 mmRW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

BOSCH
Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung.

C13

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SSC 19,0 a
1. Edition

En

PES 6 P 130 A 520 LS 3091 RQV 300-750 PA 614

supersedes
company: SSC M
engine: Poyaud - L 685
368 kW (500 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC)= RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	14,7+0,1	44,5-44,9	0,4 (0,8)			
300	5,5-5,7	2,2-2,8	0,4 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	780	15,2-17,8	-	-	-	ca. 11	100 300	min.7,1 5,2-5,4	250 420 580 750	0,3-0,6 3,3-3,7 5,1-5,4 8,0
ca.66	13,7 4,0 1000	790-800 850-880 0-1,0				325-435 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
750	445,0-449,0 (442,0-452,0)	790-800*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

BOSCH Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung.

C14

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 d
1. Edition
En

Testoil-ISO 4113

VE 6/10 F 2400 L 116-1
0 460 406 019

supersedes
company VWW
engine: 087- T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,4-1,8	mm	0,75	
1.2 Supply pump pressure	1500	5,7-6,3	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	26,5-27,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0-45,0	cm³/1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0-16,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75 bar	n = rev/min	1200	1500	2400
	mm	0,2-1,0 (0-1,3)	(0,9-2,3)	4,1-4,9 (3,8-5,2)
2.2 Supply pump LDA=0,75 bar	n = rev/min	600		2400
	bar (kgf/cm²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2750	max. 4,0		0,75
	2600		(9,0-17,0)	0,75
	2400	35,5-37,5	(34,2-38,8)	0,75
	1500		(42,2-46,8)	0,75
	* 800	33,5-34,5	(31,0-37,0)	0,30
	600		(24,0-30,0)	0
switch-off mech.	2400	0		
elektr.	400	0		
Idle stop	375		(4,0-12,0)	
	600	max. 3,0		
End stop	400	min. 20		
	500	max. 30		

2.4 Solenoid — max. cut-in voltage xxx min 10 V
xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
AK	21,8-23,8
XL	9,4-12,7

Observations

Manifold-presssure compensator stroke = 4,2 mm.
Correction at the adjusting nut (46)

C15

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,4 b

1. Edition

En

VE 6/10 F 2400 L 116-2

0 460 406 020

supersedes –

company: VWW

engine: 087 T

Testoil-ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,5 - 1,9	mm	0,75	
1.2 Supply pump pressure	1500	5,7 - 6,3	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	25,5 -26,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0 -45,0	cm³/1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0 -10,0	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0 -16,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA = 0,75bar	n = rev/min	1200	1500	2400
	mm	0,2-1,0(0-1,3)	(1,0-2,4)	5,4-6,2(5,1-6,5)
2.2 Supply pump LDA = 0,75bar	n = rev/min	600		2400
	bar (kgf/cm²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2750	max. 4,0		0,75
	2600		(9,0-17,0)	0,75
	2400	35,0-37,0	(33,7-38,3)	0,75
	1500		(42,2-46,8)	0,75
	* 800	32,5-33,5	(30,0-36,0)	0,30
	600		(23,0-29,0)	0
switch-off elect.	400	0		
Idle stop	375		(4,0-12,0)	
	600	max. 3,0		
End stop	400	min. 20,0		
	500	max. 30,0		
2.4 Solenoid	max. cut-in voltage xxx min. 10 V ~~xxxxxxxxx~~ rated voltage 12V.			

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
ØK	21,8-23,8
ØL	9,4-12,7

Observations

Manifold-presssure compensator stroke = 4,2 mm.
Correction at the adjusting nut (46)

C16

CA6

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© 1980 by Robert Bosch GmbH Postfach 50, D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

12.82

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 a
1. Edition
En

VE 6/10 F 2400 L 116

0 460 406 018

supersedes
company VWW
engine: 087- T

Testoil-ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,4 - 1,8	mm	0,75	
1.2 Supply pump pressure	1500	5,7 - 6,3	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	26,5 -27,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0 -45,0	cm³/1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0 -10,0	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0 -16,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75bar	n = rev/min	1200	1500	2400
	mm	0,2-1,0(0-1,3)	(0,9-2,3)	4,1-4,9(3,8-5,2)
2.2 Supply pump LDA=0,75bar	n = rev/min	600		2400
	bar (kgf/cm²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2750	max. 4,0		0,75
	2600		(9,0-17,0)	0,75
	2400	35,5-37,5	(34,2-38,8)	0,75
	1500		(42,2-46,8)	0,75
	* 800	33,5-34,5	(31,0-37,0)	0,30
	600		(24,0-30,0)	0
switch-off électr.	400	0		
Idle stop	375		(4,0-12,0)	
	600	max. 3,0		
End stop	400	min. 20,0		
	500	max. 30,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V
test voltage xxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
*K	21,8-23,8
*L	9,4-12,7

Observations

Manifold-presssure compensator stroke = 4,2 mm.
Correction at the adjusting nut (46)

C17

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VMA 2,2a

En 3. Edition

VE 4/10 F 2100 L 75

0 460 404 024

supersedes: 10.82
company: VM-Motori
engine: HR 492 HT

Testoil-ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1600	6,3- 6,7	mm	0,7	
1.2 Supply pump pressure	1600	5,8- 6,4	bar (kgf/cm²)	0,7	
1.3 Full-load delivery without charge-air pressure	1600	31,5-34,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1600	47,5-48,5	cm³/1000 strokes	0,7	2,5 (3,0
1.4 Idle speed regulation	400	15,0-19,0	cm³/1000 strokes	0	2,5 (3,0)
1.5 Start	100	min. 65,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2300	24,5-30,5	cm³/1000 strokes	0,7	
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,7 bar	n = rev/min	1000	1600	2100
	mm	1,9-2,7(1,6-3,0)	(5,8-7,2)	9,3-9,9(8,9-10,3)
2.2 Supply pump LDA=0,7 bar	n = rev/min	400		2100
	bar (kgf/cm²)	1,5-2,1		7,5-8,1
Overflow delivery	n = rev/min	500		2100
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2450	max. 5,0	0,7
	2300	(23,5-31,5)	0,7
	2100	41,5-44,5(40,7-45,3)	0,7
	1600	(30,7-35,3)	0
	1600	(45,7-50,3)	0,7
	* 700	43,0-46,0(41,5-47,5)	0,3
	600	34,0-37,0(32,5-38,5)	0
switch-off	2100	0	
Idle stop	550-750	0	
	400	(13,0-21,0)	
End stop	350	min. 37,0	
	500	max. 37,0	

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V
xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2- 3,4
KF	5,7- 5,9
MS	1,4- 1,6
SVS	4,4- 4,6
* FH	1,8- 2,4
XK	20,2-22,2
XL	10,0-13,3

Observations

Manifold-presssure compensator stroke = 4,2 mm.
Correction at the adjusting nut (46)

C18

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 2,3e
2. Edition
En

Testoil-ISO 4113

VE 4/10 F 2075 R 67
0 460 404 012

supersedes 6.82
company: Peugeot
engine: XD 2 S - US

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting -- mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	5,0-5,4	mm	0,8	
1.2 Supply pump pressure	1500	5,4-6,0	bar (kgf/cm²)	0,8	
1.3 Full-load delivery without charge-air pressure	600	36,0-39,0	cm³/1000 strokes	0	2,5(3,0)
Full-load delivery with charge-air pressure	1125	48,7-49,7	cm³/1000 strokes	0,8	
1.4 Idle speed regulation	390	8,0-12,0	cm³/1000 strokes	0	2,5(3,0)
1.5 Start	100	min. 53,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2400	9,5-15,5	cm³/1000 strokes	0,8	
1.7 Load-dependent start of delivery	--	--			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,8 bar	n = rev/min	600	1000	1500	2000
	mm	1,3-2,1(1,0-2,4)	2,9-3,5(2,5-3,9)	(4,5-5,9)	6,9-7,7(6,6-8,0)
2.2 Supply pump LDA=0,8 bar	n = rev/min	400			2075
	bar (kgf/cm²)	1,6-2,2			7,6-8,2
Overflow delivery	n = rev/min	500			2075
	cm³/10 s	55-110(40-125)			55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2450	max. 9,0		0,8
	2400		(7,5-16,5)	0,8
	2300	25,5-31,5	(24,5-32,5)	0,8
	2000	44,3-46,7	(43,2-47,8)	0,8
	1400	50,6-53,0	(49,5-54,1)	0,8
	1125		(46,9-51,5)	0,8
	+ 750	42,3-43,3	(39,8-45,8)	0,25
	600	36,0-39,0	(34,5-40,5)	0
switch-off	2075	0		
Idle stop	450-550	0		
	390		(6,0-14,0)	
End stop	400			
	500			

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V xxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	5,7-5,9
MS	0,9-1,1
SVS	max.1,4
ΔK	20,2-22,2
ΔL	8,8-12,2

Observations

Manifold-pressure compensator stroke =4,5 mm
Correction at the adjusting nut (46)

C19

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,3 b
3. Edition
En

VE 6/10 F 2400 L 32-1 (P)
0 460 406 009; 010

supersedes 6.82
company: VW
engine: 087/10 Autom.

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,8 - 3,2	mm		
1.2 Supply pump pressure	1500	5,2 - 5,8	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5 - 29,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	350	10,0 - 14,0	cm³/1000 strokes		2,5(3,0)
1.5 Start	100	min. 42,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2600	15,0 - 22,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2400
	mm	0,8-1,6(0,5-1,9)	(2,3-3,7)	6,0-6,8(5,7-7,1)
2.2 Supply pump	n = rev/min	600		2400
	bar (kgf/cm²)	2,8-3,4		7,7-8,3
Overflow delivery	n = rev/min	500		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2700	6,0-12,0	
	2600	(14,5-22,5)	
	2400	22,0-24,0 (20,7-25,3)	
	1500	(26,7-31,3)	
	750	26,0-29,0 (24,5-30,5)	
switch-off	2400	0	
Idle stop	400	3,0-9,0	
	350	(8,0-16,0)	
End stop	400	min. 20	
	500	max. 25	

2.4 Solenoid

max. cut-in voltage xxx min. 10,0 V
~~xxxxxxxx~~ rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	6,4-6,6
MS	1,4-1,6
SVS	max.3,0
~~XK~~	18,5-20,5
~~XL~~	9,2-12,9

Observations

Stop check (lever) at n = 2400 min-1

10.82

C20

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 9,8 b
1. Edition
En

PE 6 P 120 A 321 RS 438 RQV 275-1200 PA 538

supersedes_
company: RVI
engine: MID 062045
152 kW (206 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5 - 3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	10,6+0,1	14,7-15,1	0,5(0,9)			
275	5,3-5,5	0,7-1,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 10	100	min.6,9	250	0,4-0,7
							275	5,3-5,5	570	3,7-3,9
ca. 64	9,6	1240-1250							880	5,3-5,5
	4,0	1310-1340							1200	8,0
	1450	0-1,0								
						280-390 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1200	147,0-151,0 (144,0-154,0)		-	-	100	180,0-200,0	-	-
					275	7,0-13,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

C21

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 9,5 a 3
1. Edition

En

PES 5 P 110 A 820 LS 434 RQV 300-1100 PA 594-1

1 - 3 - 5 - 4 - 2 je 72 ° ± 0,5 ° (± 0,75 °)

supersedes

company Daimler Benz
engine: OM 409
135 kW (184 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,4+0,1	11,0-11,2	0,4(0,8)			
300	7,6-7,8	1,2-1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.34	100	min. 8,5	250	1,0-1,3
							300	7,0-7,2	530	3,9-4,2
ca.64	9,4	1140-1150							820	5,5-5,8
	4,0	1175-1205							1100	8,2
	1300	0 - 1,0				320-435 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1100	110,0-112,0 (107,0-115,0)	1140-1150*	600	93,0-97,0 (90,0-100,0)	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH
Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung
© By Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

C22

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,41
2. Edition
En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 RQV 300-1100 PA 594-2

supersedes 81
company Daimler-Benz
engine: OM 407 h

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 (3,15-3,35) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	12,5 - 12,7	0,4(0,8)			
300	7,7-7,9	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 40	100	min. 9,4	250	1,0-1,3
							300	7,7-7,9	550	4,0-4,3
ca. 62	10,3	1140-1150							800	5,3-5,7
	4,0	1175-1205							1100	8,1
	1300	0 - 1								
						320-450 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1100	125,0-127,0 (122,0-130,0)	1140-1150 *	600	108,0-112,0 (105,0-115,0)	100	130,0-150,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung.

C23

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,4 L3

2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 ROV 300-1100 PA 594-3

supersedes 2.82

company: Daimler-Benz

engine: OM 407
162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2-3,3 (3,15-3,35) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,0+0,1	11,6 - 11,8	0,4(0,8)			
300	7,8-8,0	1,4 - 2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.32	100	min. 9,0	250	1,0-1,3
							300	7,3-7,5	530	3,9-4,2
ca. 60	10,0	1140-1150								
	4,0	1175-1205				320-450			820	5,5-5,8
	1300	0 - 1,0							1100	8,1
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
1100	116,0-118,0 (113,0-121,0)	1140-1150*	600	103,0-107,0 (100,0-110,0)	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung

C24

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 HAN 7,2 b
1. Edition
En

PE 4 A 95 D 420 RS 2662 RSV 350-1100 A 8 B 1120 DR

supersedes-
company Hanomag
engine D 943 A 1

Use overflow valve 1 417 411 000
** Test cold-start device according to VDT-DAF-004, page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	11,0-11,2	0,3(0,6)			
350	6,4-6,6	1,1-1,7	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca.19	350	6,0	1100	11,3-11,4
	x =	3,75					100	min.19,5	500	11,8-11,9
ca.49 (2a)	10,3	1140-1150					350	6,4-6,6	980	11,4-11,6
	4,0	1195-1225					490-550	= 2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to) rev/min 3	(3a) Fuel delivery charactenstics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1100	109,5-111,5 (107,5-113,5)	1140-1150*	500	104,0-107,0 (102,0-109,0)	100	19,5-21,0 mm RW **		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

D1

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 FIA 12,9 a
2. Edition

En

supersedes 2.81
company Fiat
engine 8260.02

Testoil-ISO 4113

PE 6 P 120 A 720 LS 3803 RQ300/1200 PA356
Testing with T nozzles and fuel lines 8 x 2 x 1000 according to ..W 400/305

1 - 6 - 5 - 4 - 3 - 2 ± 0,50°
0 -75 -120-195-240-315° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,50-3,60 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3 - 17,7	0,5(0,9)			
300	5,9-6,1	2,8 - 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point		Test specifications		Setting point		Test specifications			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	rev/min 5	Control rod travel mm 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	15,6-16,4	650	16,0	8,3	1245-1260	300	6,0	100	min 7,5	1200	9,3-9,4
				4,0	1280-1310			300	5,9-6,1	650	9,3-9,5
				1400	0 - 1,0			400-440	=2,0		

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop	Fuel delivery charactenstics		Starting fuel delivery	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/100 strokes 7
1200	173,0 - 177,0 (170,0 - 180,0)	-	-	-	100	19,5-21 mm RW
					300	28,0-36,0

Checking values in brackets

1.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

D2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 9,5 a 5
1. Edition
En

PES 5 P 110 A 820 LS 434 RSV 350-1100 P0/485
1 - 3 - 5 - 4 - 2 je 72° ± 0,5° (± 0,75°)

supersedes
company Daimler-Benz
engine OM 409
137 kW (186 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1080	10,9+0,1	12,0-12,2	0,4 (0,8)			
350	6,8-7,0	1,1-1,7	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	-	-	-	-	-
	x = 2,25									
ca. 34 (2a)	9,9	1120-1130								
	4,0	1180-1210								
	1300	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat Note: changed to) rev/min 3	(3a) Fuel delivery charactenstics rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle rev/min 6	cm³/1000 strokes 7	(4a) Idle stop rev/min 8	Control rod travel mm 9
1080	120,0-122,0 (117,0-125,0)	1120-1130*	-	-	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

D3

D3

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 FOR 5,9 l 3

En 1. Edition

Testoil-ISO 4113

PES 6 A 90 D 210 RS 2629 RSV 350-1300 AOB 2139 L

supersedes -
company: Ford GB
engine: 380

At port closing the locating pin must engage in the slot the pointer.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,7 - 2,8 (2,65-2,85) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,9+0,1	7,2 - 7,3	0,3(0,45			
350	6,4-6,5	0,9- 1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800 x =	0,3-1,0 2,75	-	-	-	ca. 34	350	6,0	-	-
(5) ca. 68	11,9 4,0 1670	1365-1375 1505-1535 0,3 - 1,7					100 350 515-575 650	min.19,0 6,4-6,6 =2,0mm max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ... rev/min 3	(3s) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5s) Idle stop: rev/min 8	Control rod travel mm 9
1250	72,0-73,0 (70,0-75,0)	1365-1375 *	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

D4

24

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 UNI 9,6 b1

1. Edition

En

PES 6 P 110 A 820 RS 424 RQ 275/1300 PA 573

supersedes–
company: IVECO-UNIC
engine: 8220-02
148 kW (204 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,2-2,3 (2,15-2,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	10,5+0,1	9,5-9,7	0,4(0,8)			
275	4,9-5,1	1,2-1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	9,5 4,0 1550	1345-1360 1410-1440 0 - 1,0	275	5,0	100 275 360-400	min.6,5 4,9-5,1 = 2,0	1300 600	10,5-10,6 10,5-10,7

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1345-1360 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/–1000 strokes 2	rev/min 3	rev/min 4	cm³/–1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1300	95,0-97,0 (92,0-100,0)	-	-	-	100	140,0-160,0

Checking values in brackets

1.83

D5

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 PER 5,8e
1. Edition

En

Testoil-ISO 4113

VE 6/12 F 1300 L 107
0 460 406 027

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

supersedes -
company: Perkins
engine: T 6.354.4

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,35 mm ±0,02 (0,04)

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	-	-	mm	-	
1.2 Supply pump pressure	1000	4,2-4,8	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	500	67,0-71,0	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1000	95,5-96,5	cm³/1000 strokes	0,75	3,5
1.4 Idle speed regulation	200	8,0-12,0	cm³/1000 strokes	0	3,5
1.5 Start	100	min. 90,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	1450	32,0-38,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min		
	mm	blockiert	
2.2 Supply pump	n = rev/min	400	1300
LDA=0,75bar	bar (kgf/cm²)	2,0-2,6	5,8-6,4
Overflow delivery	n = rev/min	500	1300
	cm³/10 s	55-138(40-153)	55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1600	0		0,75
	1550	1,0-9,0	(0 -10,0)	0,75
	1450		(30,0-40,0)	0,75
	1250	90,0-93,0	(88,5-94,5)	0,75
	1000		(93,0-99,0)	0,75
	* 600	85,0-87,0	(83,0-89,0)	0,32
	500		(65,3-72,7)	0
switch-off	1300	0		
Idle stop	200		(5,0-15,0)	
	300	max. 7,0		
	450	0		
End stop	150	min. 90,0		
	250	max. 65,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V; test voltage xxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	-
KF	5,2-5,3
MS	1,2-1,3
SVS	max. 1,2
KK	20,2-22,2
KL	8,4-11,7

Observations

* Manifold-pressure compensator stroke = 4,5 mm. Correction at the adjusting nut (46)

D6

12.82

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

D6

Test Specifications Distributor-type Fuel-injection Pumps

WWP 001/4 PER 5,8c2
2. Edition
En

Testoil-ISO 4113

VE 6/12 F 1300 L 21-3
0 460 426 022

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

supersedes 4.82
company: Perkins
engine: T 6.354.4

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting — mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	600	2,2-2,8	mm	0,74	
1.2 Supply pump pressure	800	4,4-5,0	bar (kgf/cm²)	0,74	
1.3 Full-load delivery without charge-air pressure	1000	70,5-73,5	cm³/1000 strokes	0	2,5(3,0)
Full-load delivery with charge-air pressure	1000	95,5-96,5	cm³/1000 strokes	0,74	
1.4 Idle speed regulation	270	8,0-12,0	cm³/1000 strokes	0	2,5(3,0)
1.5 Start	100	min. 80,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	1480	47,0-53,0	cm³/1000 strokes	0,74	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	400	600	800
LDA=0,75bar	mm	0,4-1,2(0,1-1,5)	(1,8-3,2)	3,8-4,6(3,5-4,9)
2.2 Supply pump	n = rev/min	400		1300
LDA=0,75bar	bar (kgf/cm²)	2,7-3,3		6,5-7,1
Overflow delivery	n = rev/min	500		1300
	cm³/10 s	55-111(40-126)		55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1550	max. 12,0		0,74
	1480		(46,0-54,0)	0,74
	1300	86,0-88,0	(85,2-89,8)	0,74
	1000		(69,7-74,3)	0
	1000		(93,7-98,3)	0,74
	* 700	82,0-84,0)	(80,7-85,3)	0,20
	500	66,5-69,5	(65,0-71,0)	0
switch-off	1300	0		
Idle stop	330-410	0		
	270		(6,0-14,0)	
End stop	120	min. 80		
	230	max. 75		

2.4 Solenoid — max. cut-in voltage / test voltage

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	5,1-5,3
MS	0,9-1,1
SVS	max. 6,0
XK_A	20,2-22,2
XK_B	11,7-15,1

Observations

* Manifold-pressure compensator stroke = 4,5 mm. Correction at the adjusting nut (46)

9.82

D7

37

Test Specifications Distributor-type Fuel-injection Pumps

WWP 001/4 PER 5,8 c4
2. Edition
En

Testoil-ISO 4113

VE 6/12 F 1300 L 21-2
0 460 426 013

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

supersedes 9.82
company: Perkins
engine: T6.354.4

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,45 mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	600	2,5-2,9	mm	0,65	
1.2 Supply pump pressure	600	3,8-4,4	bar (kgf/cm²)	0,65	
1.3 Full-load delivery without charge-air pressure	1000	78,5-82,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1000	92,5-93,5	cm³/1000 strokes	0,65	3,0(3,5)
1.4 Idle speed regulation	270	8,0-12,0	cm³/1000 strokes	0	3,0(3,5)
1.5 Start	100	min. 78,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	1480	42,0-50,0	cm³/1000 strokes	0,65	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	400	600	800
LDA = 0,65 bar	mm	0,7-1,5(0,4-1,8)	(2,0-3,4)	3,8-4,6(3,5-4,9)
2.2 Supply pump	n = rev/min	400		1300
LDA = 0,65 bar	bar (kgf/cm²)	3,0-3,6		6,0-6,6
Overflow delivery	n = rev/min	500		1300
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1550	max. 9,0		0,65
	1480		(41,0-51,0)	0,65
	1300	86,5-89,5	(83,0-93,0)	0,65
	1000		(90,0-96,0)	0,65
	1000		(77,5-83,5)	0
	* 700	84,5-88,5	(83,5-89,5)	0,32
	500	68,5-72,5	(66,8-74,2)	0
switch-off	1300	0		
Idle stop	330-420	0		
	270		(5,0-15,0)	
End stop	150	min. 78		
	230	max. 75		

2.4 Solenoid — max. cut-in voltage / test voltage

3. Dimensions

for assembly and adjustment

Designation	mm
K	
KF	5,1-5,4
MS	0,9-1,1
SVS	max.6,0
↕K	20,2-22,2
↕L	12,5-15,8

Observations

* Manifold-pressure compensator stroke = 4,0 mm. Correction at the adjusting nut.(46)

D8

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

Test Specifications Fuel Injection Pumps and Governors

(1A)

40

WPP 001/4 SCA 11,0 r 4
3. Edition:

En

PE 6 P 110 A 720 RS 3040 RSV 350-1100 P1/481

supersedes 10.81
company Scania DS 11
engine Tractor

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,3-3,4 (3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,3+0,1	15,8-16,0	0,4(0,8)			
350	3,6-3,8	0,9-1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed: 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 26	350	3,2		
	x =	2,75					100	min. 20,0		
ca.51 (2a)	11,9	1140-1150					350	3,6-3,8		
	4,0	1190-1220					400-460	= 2,0		
	1350	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ..) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1100	158,0-160,0 (155,0-163,0)	1140-1150*	600	159,0-163,0 (156,0-166,0)	100	210,0-260,0 = RW 20,0-21,0 mm	-	-
					350	9,0-13,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 5,7 v 9
2. Edition
En

PES 6 A 90 D 410 RS 2596 RSV 350-750 A0B 741 L

superseded 8.82
company Daimler-Benz
engine: OM 352 A
65 kW (88 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 - 2,1 (1,95-2,15) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,0+0,1	6,6 - 6,7				
100	-	7,8 - 8,8				

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	500	0,3-1,0	-	-	-	ca. 14	350	8,1	-	-
	x =						100	min.19,0 **		
(5) ca.26	12,0	750-755					360-420	= 2,0		
	4,0	788-801								
	850	0,3-1,7								

The numbers denote the sequence of the tests. Set auxiliary idle spring at 2.0 mm control-rod travel.

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ... rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
700	65,5-66,5 (63,5-68,5)	750-755*	-	-	100	71,0-81,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

D10

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

DAO

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 11,4 1 4
2. Edition
En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 RSV 350-750 P 1/487

supersedes 4.82
company: Daimler-Benz
engine: OM 407

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2-3,3 (3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
730	11,7+0,1	11,9 - 12,1	0,4(0,8)			
350	7,3-7,5	1,3 - 2,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	-	-	-	-	-
	x=2,5									
(5) ca.	10,7	750-755								
	4,0	785-795								
	850	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop Test oil temp. 40°C (104°F)		(6) Rotational-speed limitat.	(3a) Fuel delivery characteristics		Starting fuel delivery idle		(5a) Idle stop	
rev/min 1	cm³/1000 strokes 2	Note: changed to ... rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
730	119,0 - 121,0 (116,0 - 124,0)	750-755*	-	-	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH
Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 11,4 L 1
2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 RQ 300/1100 PA 327-2

supersedes 8.81
company Daimler-Benz
engine OM 407 h
177 kW (241 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 (3,15-3,35) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	12,5 - 12,7	0,4(0,8)			
300	7,7-7,9	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point		Test specifications		Setting point		Test specifications			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	rev/min 5	Control rod travel mm 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,0-14,0	600	13,5	10,3 4,0 1350	1145-1160 1180-1210 0 - 1,5	300	7,8 365-405 =	100 300 2,0 mm	min. 9,4 7,7-7,9	-	-

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation At 1145 - 1160 min -1

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/100 strokes 7
1100	125,0 - 127,0 (122,0 - 130,0)	-	600	110,0 - 114,0 (107,0 - 117,0)	100	130,0 - 150,0

Checking values in brackets

1.83

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 9,5 a
3. Edition

3.

En

Testoil-ISO 4113

PES 5 P 110 A 820 LS 434 RQ 300/1100 PA 327-3

1 - 3 - 5 - 4 - 2 je 72° ± 0,5° (0,75°)

supersedes 8.81 ?.87

company Daimler-Benz

engine OM 409
141 kW (192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) Zyl. 5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,7+0,1	12,0 - 12,2	0,4(0,8)			
300	7,0-7,2	1,2 - 1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point		Test specifications		Setting point		Test specifications			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	rev/min 5	Control rod travel mm 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,8-14,6	600	14,2	9,7 4,0	1145-1160 1175-1205	300	7,1	100 300 375-415=2,0	min.10,0 7,0-7,2	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1145 - 1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/100 strokes 7
1100	120,0 - 122,0 (117,0 - 125,0)	-	600	108,0 - 114,0 (105,0 - 117,0)	100	130,0 - 150,0

Checking values in brackets

1.83

D13

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 9,5 a 4
1. Edition
En

PES5P110A820 LS 434 RQ300/1100 PA 327-4

supersedes –
company: Daimler-Benz
engine: OM 409
135 kW (184 PS)

1 - 3 - 5 - 4 - 2 je 72° ±0,50° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,1+0,1	11,0-11,2	0,4(0,8)			
300	8,0-8,2	1,2 - 1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,8-14,6	600	14,2	10,1 4,0 1300	1145-1160 1175-1205 0 - 1,0	300	7,1	100 300	min. 8,7 7,0-7,2	–	–

Torque-control travel on flyweight assembly dimension a = – mm

Speed regulation: At 1145-1160 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1100	110,0-112,0 (107,0-115,0)	–	600	94,0-98,0 (91,0-101,0)	100	130,0-150,0

Checking values in brackets

1.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

DAY

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 RQ 300/950 PA 483

supersedes 3.82
company: Daimler-Benz
engine: OM 407
162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 (3,15-3,35) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	12,1+0,1	12,2 - 12,4	0,4(0,8)			
300	8,0-8,2	1,4 - 2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ▭.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,0-14,0	600	13,5	11,1 4,0 1150	995-1010 1010-1045 0 - 1,0	300	8,1	100 300 410-450	min.9,7 8,0-8,2 =2,0mm	-	-

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 995 - 1010 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
950	122,0 - 124,0 (119,0 - 127,0)	-	600	118,0 - 122,0 (115,0 - 125,0)	100	140,0 - 160,0

Checking values in brackets

1.83

En

Testoil-ISO 4113

PE6A90D410RS2124 RQ 450/1250 AB 812

supersedes 11.80
company Daimler-Benz
engine: OM 360
141kW (192 PS)

1 - 5 - 3 - 6 - 2 - 4
0 - 60-120-180-240-300° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,10-2,30) 2,15-2,25 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,2+0,1	8,6 - 8,7	0,3(0,45)			
450	5,9-6,1	1,2-1,8	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ① Control rod travel rev/min 1	mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
700	15,6-16,4	700	16,0	9,2	1295-1310	450	6,0	100	min. 7,5	-	-
				4,0	1345-1375			450	5,9-6,1		
								600	0 - 1,0		
								500-540	=2,0		

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1295-1310 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1250	86,0 - 87,0 (84,0 - 89,0)	800	800	80,0 - 83,0 (78,0 - 85,0)	100	19,0-21,0 mm RW

Checking values in brackets

1.83

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,4 c
1. Edition
En

VE 6/10 F 2400 L 116-3

0 460 406 021

supersedes
company: VWW
engine: 087 T

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	1,5 - 1,9	mm	0,75	
1.2 Supply pump pressure	1500	5,7 - 6,3	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	25,5 -26,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0 -45,0	cm³/1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0 -10,0	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0 -16,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75bar	n = rev/min	1200	1500	2400
	mm	0,2-1,0(0-1,3)	(1,0-2,4)	5,4-6,2(5,1-6,5)
2.2 Supply pump LDA=0,75bar	n = rev/min	600		2400
	bar (kgf/cm²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2750	max. 4,0		0,75
	2600		(9,0-17,0)	0,75
	2400	35,0-37,0	(33,7-38,3)	0,75
	1500		(42,2-46,8)	0,75
	* 800	32,5-33,5	(30,0-36,0)	0,30
	600		(23,0-29,0)	0
switch-off mech.	2400	0		
elektr.	400	0		
Idle stop	375		(4,0-12)	
	600	max. 3,0		
End stop	400	min. 20,0		
	500	max. 30,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V
xxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
XK	21,8-23,8
XL	9,4-12,7

Observations

Manifold-presssure compensator stroke = 4,2 mm.
Correction at the adjusting nut (46)

D17

BOSCH Geschäftsbereich KH. Kundendienst Kfz-Ausrüstung.

12.82

D17

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 1,6 V

2. Edition

En

VE 4/9 F 2000 R 86

0 460 494 088

supersedes: 5.82
company: VWW
engine: 086-1.6 Bell

Testoil-ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting -- mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9-3,3	mm		
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	33,5-34,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1.4 Idle speed regulation	350	5,0-9,0	cm³/1000 strokes		2,5(3,0)
1.5 Start	100	min.38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2100	21,0-27,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	--	--			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2000
	mm	1,3-2,1(1,0-2,4)	(2,4-3,8)	4,6-5,4(4,3-5,7)
2.2 Supply pump	n = rev/min	400		2000
	bar (kgf/cm²)	2,1-2,7		6,0-6,6
Overflow delivery	n = rev/min	600		2000
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2200	0,5-7,5	(0-8,0)	
	2100		(20,0-28,0)	
	2000	27,0-29,0	(25,7-30,3)	
	1500		(31,7-36,3)	
	600	22,0-25,0	(20,5-26,5)	
switch-off elect.	400	0		
Idle stop	460	max. 1,5	(3,0-11,0)	
End stop	400	min. 18,5		
	500	max. 24,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V
xxxxxxxxxxrated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,5
+ FH	1,8-2,4
A XK	18,4-20,4
B XL	6,1-8,4

Observations

D18

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 Volvo 3,6 g1
1. Edition
En

VE 6/11 F 1800 L 19-7
0 460 416 025

supersedes
company: Volvo
engine: TAMD 40 B (121 kW)

Testoil-ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,2 mm ±0,02 (0,04)

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,6-3,0	mm		
1.2 Supply pump pressure	1500	6,2-6,8	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	78,0-79,0	cm³/1000 strokes		3,0(3,5)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	400	8,5-12,5	cm³/1000 strokes		3,0(3,5)
1.5 Start	100	min. 60	cm³/1000 strokes		
1.6 Full-load speed regulation	1900	43,5-49,5	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	1750
	mm	0,7-1,5(0,4-1,8)	(2,1-3,5)	3,6-4,4(3,3-4,7)
2.2 Supply pump	n = rev/min	400		1750
	bar (kgf/cm²)	2,3-2,9		7,1-7,7
Overflow delivery	n = rev/min	600		1800
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2130	max. 2,5	
	2050	6,5-12,5(5,0-14,0)	
	1900	(42,0-51,0)	
	1770	72,8-75,8 (71,6-77,0)	
	1500	(75,8-81,2)	
	600	66,5-70,5 (65,1-71,9)	
switch-off			
Idle stop	580	0	
	500	max. 2,0	
	400	(6,0-15,0)	
End stop	120	min. 60	
	220	max. 60	
2.4 Solenoid	max. cut-in voltage	xxxx min. 10 V	
	xxxxxxxxxx	rated voltage 12V.	

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,9-6,1
MS	1,4-1,6
SVS	max. 2,3
XK	18,7-20,7
B XL	10,9-14,2

Observations

BOSCH Geschäftsbereich KH. Kundendienst Kfz-Ausrüstung

12.82

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 1,9a
1. Edition
En

Testoil-ISO 4113

VE 4/9 F 2300 R 114
0 460 494 112

supersedes
company: Peugeot
engine: XUD g

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting — mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	2000	7,8-8,2	mm		
1.2 Supply pump pressure	2000	5,9-6,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1250	31,5-32,5	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	300	25,0-29,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 45	cm³/1000 strokes		
1.6 Full-load speed regulation	2500	7,0-13,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	2000	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1250	2000
	mm	2,0-3,0(1,8-3,2)	3,4-4,2(3,1-4,5)	(7,3-8,7)
2.2 Supply pump	n = rev/min	600	1250	
	bar (kgf/cm²)	2,0-2,6	3,9-4,5	
Overflow delivery	n = rev/min	600		2300
	cm³/10 s	55-111(40-126)		55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2650	max. 4,0		
	2500		(6,0-14,0)	
	2400	21,0-27,0	(20,0-28,0)	
	2250	27,0-29,0	(25,7-30,3)	
	2000	28,0-30,0	(26,7-31,3)	
	1250		(29,7-34,3)	
	600	27,0-30,0	(25,5-31,5)	
switch-off				
Idle stop	300		(23,0-31,0)	
	400	max. 10,0		
	450-550	0		
End stop	250	min. 45		
	500	max. 35		

2.4 Solenoid: max. cut-in voltage xxxx min. 10 V
xxxxxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,3
KF	5,7-5,9
MS	1,3-1,5
SVS	max. 4,0
A XK	18,9-20,9
B XL	9,6-13

Observations

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung.

11.82

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 REN 2,0 e
2. Edition
En

VE 4/9 F 2400 R 95
0 460 494 105

supersedes 6.82
company: Renault
engine: F 8 M

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	4,1-4,5	mm		
1.2 Supply pump pressure	1400	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1000	30,0-31,0	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0	cm³/1000 strokes		2,5(3,0)
1.5 Start	100	min. 42,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2650	10,5-16,5	cm³/1000 strokes		
1.7 Load-dependent start of delivery	1400	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	2000	2400
	mm	2,3-3,1(2,0-3,4)	(3,6-5,0)	6,3-7,1(6,0-7,4)	7,0-7,7(6,6-8,0)
2.2 Supply pump	n = rev/min	600			2400
	bar (kgf/cm²)	2,5-3,1			7,7-8,3
Overflow delivery	n = rev/min	600			2400
	cm³/10 s	55-138(40-153)			55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2750	max. 6,0		
	2650		(9,5-17,5)	
	2500	21,0-29,0	(21,0-29,0)	
	2400	26,5-29,1	(25,5-30,1)	
	2100	27,5-29,9	(26,4-31,0)	
	1400	30,6-32,6	(29,3-33,9)	
	1000		(28,2-32,8)	
	600	24,3-27,3	(22,8-28,8)	
switch-off				
	2400	0		
Idle stop	650	0		
	600	0,2-5,2		
	425		(4,0-12,0)	
End stop	330	min. 30,0		
	500	max. 29,0		

2.4 Solenoid	max. cut-in voltage	xxx min. 10,0 V
	test voltage	xxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	2,8
XK	18,7-20,7
XL	9,5-12,8

Observations

D21

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 SOF 2,5c
2. Edition
En

Testoil-ISO 4113

VE 4/9 F 1950 R 22-4
0 460 494 070

supersedes 4.82
company Sofim
engine RJV-LKW

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,3 mm ± 0,02 (0,04) mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in deliver. cm³
1.1 Timing device travel	1800	7,4-7,8	mm		
1.2 Supply pump pressure	1800	6,2-6,8	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1950	33,5-34,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1.4 Idle speed regulation	350	6,0-10,0	cm³/1000 strokes		2,5(3,0)
1.5 Start	100	min.55,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2150	14,0-20,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery		--			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	400	1100	1800
	mm	1,9-2,7(1,6-3,0)	4,9-5,5(4,5-5,9)	(6,9-8,3)
2.2 Supply pump	n = rev/min	400	1100	
	bar (kgf/cm²)	2,9-3,5	4,6-5,2	
Overflow delivery	n = rev/min	500		1950
	cm³/10 s	55-111(40-126)		55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2250	max. 10,0	
	2150	(13,0-21,0)	
	1950	(31,7-36,3)	
	1100	37,7-40,3 (36,7-41,3)	
	600	30,0-33,0 (28,5-34,5)	
switch-off	1950	0	
Idle stop	500	max.5,0	
	350	(4,0-12,0)	
End stop	350	min.32	
	480	max.34	
2.4 Solenoid	max. cut-in voltage	min. 10 V	
	test voltage	rated voltage 12V.	

3. Dimensions

for assembly and adjustment

Designation	mm
K	--
KF	5,4-5,6
MS	1,7-1,9
SVS	max.2,7
* FH	1,8-2,4
A	
B	

Observations
*operating stroke (KSB)

D22

D22

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6v1
3. Edition
En

Testoil-ISO 4113

VE 4/9 F 2000 R 85
0 460 494 086

supersedes 6.82
company: VWW
engine: Industrie-Motor 065.5

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9-3,3	mm		
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	32,5-33,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0	cm³/1000 strokes		2,0(3,0)
1.5 Start	100	min. 38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2050	9,0-15,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	--	--			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2000
	mm	1,3-2,1(1,0-2,4)	(2,4-3,8)	4,6-5,4(4,3-5,7)
2.2 Supply pump	n = rev/min	600		2000
	bar (kgf/cm²)	2,8-3,4		6,1-6,7
Overflow delivery	n = rev/min	600		2000
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2070	max. 2,0		
	2050		(8,0-16,0)	
	2000	29,0-31,0	(27,7-32,3)	
	1500		(30,7-35,3)	
	600	21,0-24,0	(19,5-25,5)	
mech. switch-off	2000	0		
elektr.	400	0		
Idle stop	600	max. 2,0		
	425		(4,0-12,0)	
End stop	400	min. 17,5		
	500	max. 23,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V
xxxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,5
+ FH	1,8-2,4
XKA	18,4-20,4
XLB	13,6-17,0

Observations
+ *operating stroke (KSB)

BOSCH Geschäft-bereich KH Kundendienst Kfz-Ausrüstung.
© 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH
12.82

D23

⑥ Test Specifications Distributor-type Fuel-injection Pumps

46

WWP 001/4 VWW 1,6v4
3. Edition

En

Testoil-ISO 4113

VE 4/9 F 1800 R 85-1
0 460 494 107

supersedes 6.82
company: VWW
engine: 638/10

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9-3,3	mm		
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	32,5-33,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0	cm³/1000 strokes		2,0(3,0)
1.5 Start	100	min. 38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1870	9,0-15,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	--	--			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	1780
	mm	1,3-2,1(1,0-2,1)	(2,4-3,8)	3,7-4,5(3,4-4,8)
2.2 Supply pump	n = rev/min	600		1780
	bar (kgf/cm²)	2,8-3,4		5,5-6,1
Overflow delivery	n = rev/min	600		1800
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1950	max. 2,0		
	1870		(8,0-16,0)	
	1780	29,9-31,9	(28,6-33,2)	
	1500		(30,7-35,3)	
	600	21,0-24,0	(19,5-25,5)	
switch-off elect.	400	0		
Idle stop	600	max. 2,0		
	425		(4,0-12,0)	
End stop	400	min. 17,5		
	500	max. 23,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V
test voltage xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,5
+ FH	1,8-2,4
X_{K_A}	18,4-20,4
X_{I_B}	9,7-13,1

Observations
+ *operating stroke (KSB)

12.82

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f1
2. Edition

En

PE 6 P 120 A 320 RS 3071 RQV 250-1025 PA 371
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes 2.81
company: Volvo
engine: TD 120 GA

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6-2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4+0,1	20,5-20,8	0,5(0,9)			
250	5,6-5,7	2,2-2,6	0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.12	100	min.7,1	250	1,1-1,2
ca.40	10,4	1065-1075					250	5,6-5,7	500	2,9-3,3
	4,0	1145-1175							800	5,1-5,4
	1300	0 - 1,0				③a			1025	7,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed ②b limitation intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
LDA 700	0,9 bar 205,0-208,0 (202,0-211,0)	1065-1075*	LDA 700	0 bar 157,0-161,0 (154,0-164,0)	100	230,0-270,0 =RW 20,0-21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P..RS 3071 +RQV.. PA 371	0,57	0,90 0 0,33	11,0-11,1 11,4-11,5 9,0-9,1 9,9-10,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f 3

1. Edition

En

PE 6 P 120 A 320 RS 3071 Y RQV 250-1025 PA 371

supersedes "

company: Volvo

engine: TD 120 G
213 kW (290 PS)

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6-2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,2+0,1	17,5-17,8	0,6(0,9)			
250	5,7-5,9	2,2-2,6	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.12 (3a)	100	min.7,2	200	0,7-0,9
							250	5,7-5,9	475	2,7-3,0
ca. 42	9,2	1065-1075					340-390=2,0		750	4,7-5,0
	4,0	1145-1175							1025	6,9
	1300	0-1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2) rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel (5) rev/min 8	Control rod travel mm 9
LDA 700	0,75 bar 175,0-178,0 (172,0-181,0	1065-1075*	LDA 700	0 bar 155,0-159,0 (152,0-162,0)	100	240,0-280,0 =RW 20,0-21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

E3

E3

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
PE 6 P..RS 3071 Y +RQV..PA 371	0,29	0,75 0 0,24	9,9-10,0 10,2-10,3 9,2-9,3 9,5-9,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 DAF 11,6 i 8
2. Edition
En

PE 6 P 110 A 320 RS 372-1
Komb.-Nr. 0 401 846 463

RQ 250/1100 PA 417-1
RQ 250/1100 PA 417

supersedes 1.82
company: DAF
engine: DKTD 1160
191 kW (260 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	11,9+0,1	13,5-13,7	0,4(0,8)			
250	6,6-6,8	0,7-1,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③ Control rod travel	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	mm 10	rev/min 11	mm 12
700	15, -16,4	700	16,0	11,0	1145-1160	250	6,7	100	min.7,8	850	12,0-12,1
				4,0	1220-1250			250	6,6-6,8	1100	11,9-12,1
				1350	0 - 1,0			460-500	= 2,0		

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA 850	0,7 bar 134,5-136,5 (132,0-139,0)	-	LDA 600	0 bar 125,0-128,0 (122,0-131,0)	100	245,0-285,0 = 19,5-21,0 mm RW

Checking values in brackets

3.83

E5

E5

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 600 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE6P..RS372-1	0,30		11,8 - 11,9
+ ..PA417-1		0,70	11,9 - 12,0
or .PA 417		0	11,3 - 11,4
		0,26	11,5 - 11,7

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

(1A)

WPP 001/4 IHC 13,4 d 40

1. Edition

En

PES 6 P 110 A 420 LS 3043 RSV 350-1100 PO/431 DR

Komb.-Nr. 0 402 076 712

supersedes
company IHC
engine DTI 817 C
309 kW (420 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	15,4+0,1	25,8-26,0	0,8			
300	5,6-5,8	0,7-1,2	0,4			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	- - -	ca. 20	350	5,5	1080	0
					100	20,0-21,0	750	0,9-1,1
					350	5,4-5,6	500	0,9-1,1
ca. 44 (2a)	1100	15,6-16,2			410	1,3-2,0		
	1200	6,0-9,2						
	1280	1,3-2,0						

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note: changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA 1100	1,2 bar 257,5-259,5 (254,5-262,5)		LDA 700	1,2 bar 284,5-288,5 (281,5-291,5)	100	255,0-295,0		
			LDA	0 bar 151,5-155,5 (148,5-158,5)				

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

BOSCH Geschäftsbereich KH Kundendienst Kfz Ausrüstung
© 1980 by Robert Bosch GmbH Postfach 50 D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

E7

E7

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
PES 6 P.. LS 3043 + RSV..PO/431 DR	0,09-0,17	0,80-0,93	Start End

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 21,9 b 1
1. Edition

En

PE 12 P 120 A 320 LS 3819-2 ROV 350-1050 PA 493

supersedes

1-5 -9 - 8 - 3 - 4 -11-10 - 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ±0,5° (±0,75°)

company Daimler-Benz
OM 424 A
engine: 357 kW (485 PS)

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Komb.-Nr.
0 401 840 711

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 -4,1 (3,95-4,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,2+0,1	15,1-15,3	0,5(0,8)			
350	4,6-4,8	1,2- 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3 (1a) (2a)	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6 (4)	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9 (3)	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.10	100	min.6,2	300	0,9-1,1
							350	4,6-4,8	550	3,4-3,6
ca. 56	9,2	1080-1090							800	4,7-4,9
	4,0	1175-1205							1050	6,8
	1350	0 - 1,0				360-500 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,6 bar	1080-1090*	LDA	0,6 bar	100	130,0-150,0	-	-
1050	151,0-153,0		1050	120,0-123,0				
	(148,0-156,0)		**	(117,0-126,0)				
			LDA	0 bar				
			500	124,0-126,0				
				(121,0-129,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Set at the reduced-delivery stop.

2.83

E9

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 12 P..LS3819-2 +ROV..PA 493	0,28	0,60 0 0,24	9,9-10,0 10,2-10,3 9,4-9,5 9,6-9,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 1 g 3
3. Edition
En

PES 4 A 85 D 410/3 RS 2638 RSV 325-1150 A 8 B 2168 L superseded 1.82

Komb.-Nr. 0 400 864 054

company: KHD
engine: BF 4 L 913 T
66 kW (90 PS) $^{-1}$
2300 min
Tractor DX 92 (1)
60 kW (82 PS) $^{-1}$
2300 min
Tractor DX 86 (2)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery (2) cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,8+0,1	8,2 - 8,3	0,3(0,45	10,6+0,1	7,5-7,6	
325	7,7-7,9	1,0 - 1,6	0,2(0,4)	7,7-7,9	1,0-1,6	

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 26	325	7,3	1150	11,8+0,1
	X = 4,0						100	min. 19,0	500	11,3+0,1
							325	7,7-7,9	965	12,0+0,2
ca.54	10,8	1190-1200					720-780	= 2,0		
(5)	4,0	1325-1355								
	1495	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to .. rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
1150 (1)	82,0-83,0 (80,0-85,0)	1190-1200*	800	74,5-77,5 (72,5-79,5)	100	108,5-118,5 = RW 17,3 - 17,9 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

E11 BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever (1)	Control rod travel mm (2)	Control rod travel mm rev/min (3)	Intermediate rated speed (4)	(5)	(6)	(4) Control-lever deflection in degrees (7)	Lower rated speed: rev/min (8)	Control rod travel mm (9)	(3) Torque control: rev/min (10)	Control rod travel mm (11)
loose	800	0,3-1,0	-	-	-	ca.26	325	7,0	1150	10,5+0,1
	x =	4,0					100	min.19,0	500	11,2+0,1
ca.56	9,6	1220-1230					325	7,4-7,6	900	10,9+0.3
(2a)	4,0	1325-1355					720-780	= 2,0		
	1475	0,3-1,7								

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min (1)	cm³/1000 strokes (2)	(6) Rotational-speed limitat. Note: changed to ...) rev/min (3)	(3a) Fuel delivery characteristics: rev/min (4)	cm³/1000 strokes (5)	Starting fuel delivery (5) Idle: rev/min (6)	cm³/1000 strokes (7)	(4a) Idle stop: rev/min (8)	Control rod travel mm (9)
(2) 1150	74,5-75,5 (72,5-77,5)	1220-1230*	800	65,5-68,5 (63,5-70,5)	100	108,5-118,5	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever (1)	Control rod travel mm (2)	Control rod travel mm rev/min (3)	Intermediate rated speed (4)	(5)	(6)	(4) Control-lever deflection in degrees (7)	Lower rated speed: rev/min (8)	Control rod travel mm (9)	(3) Torque control: rev/min (10)	Control rod travel mm (11)
(2a)										

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min (1)	cm³/1000 strokes (2)	(6) Rotational-speed limitat. Note: changed to ...) rev/min (3)	(3a) Fuel delivery characteristics: rev/min (4)	cm³/1000 strokes (5)	Starting fuel delivery (5) Idle: rev/min (6)	cm³/1000 strokes (7)	(4a) Idle stop: rev/min (8)	Control rod travel mm (9)

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

E12

E12

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 6,1 a 1
3. Edition
En

PES 6 A 85 D 410/3 RS 2415 RS 325/1325 A0B 691 DL
709 DL

superseded: 1.82
company: KHD
engine: BF6 L 913
110 kW (150 PS)
2650 min^{-1}

Test RS governor according to WPP 001/4
KHD 1 c.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9-2,0 (1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1325	12,0+0,1	8,7 - 8,8	0,3(0,45)			
325	8,2-8,4	1,4 - 2,0	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed			Intermediate rated speed			(4) Lower rated speed			(3) Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-		325	6,5	1325	12,0+0,1
	X =	7,0							500	12,5+0,2
							100	min.16,0	1060	12,1+0,2
ca.68	11,0	1355-1365					325	6,4-6,6		
(5)	4,0	1450-1480					500	3,4-4,0		
	1600	0,3-1,7					1330-1370	=2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop Test oil temp. 40°C (104°F)		(6) Rotational-speed limitat.	(3a) Fuel delivery characteristics		Starting fuel delivery idle		(5a) Idle stop	
rev/min 1	cm³/1000 strokes 2	Note: changed to ... rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1325	0,7 bar 86,5-87,5 (84,5-89,5)	1355-1365*	LDA 500	0 bar 56,0-58,0 (53,5-60,5)	100	15,0-16,0 mm RW	-	-
			LDA 800	0,7 bar 76,5-78,5 (74,0-81,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

E13

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 A..RS 2415	0,27		11,6 - 11,8
+ ..AOB 691 DL		0,70	12,5 - 12,7
+ ..AOB 709 DL		0,37	12,2 - 12,3
		0	11,3 - 11,5

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

E14

(1A)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 KHD 4,7 c
2. Edition
En

PES 5 A 80 D 410/3 RS 2603 RS 325/1650 A 0 B 2087 L

supersedes 10.82
company: KHD
engine: F 5 L 912
63 kW (85 PS)
3000 min^{-1}

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 - 2,0 (1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1500	9,9-10,0	5,1 - 5,2	0,2(0,35)			
325	8,7-8,9	1,7 - 2,1	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	(4) Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	VH max	325	8,8	-	-
						FHca.18	100	min.13,6		
							325	8,7-8,9		
VH ca.49	8,9	1690-1700					550-590	=2,0		
(5) max.	4,0	1740-1770					600	max.1,8		
	1900	0 - 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2) Full-load stop: Test oil temp. 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ... rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle: rev/min 6	cm³/1000 strokes 7	(5a) Idle stop: rev/min 8	Control rod travel mm 9
1500	50,5-51,5 (49,0-53,0)	1690-1700*	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

E15

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 18,3 e
2. Edition
En

PE 10 P 120 A 320 LS 3824 RQ 300/1050 PA 656
1- 8- 7- 6 - 3 - 5 - 2 - 10 - 9 - 4
0-27-72-99 -144-171-216-243 -288-315° ± 0,5° (± 0,75°)
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes 10.82
company: Daimler-Benz
engine: OM 423 LA
346 kW (470 PS)
Euclid
Komb.-Nr.
0 401 849 707

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,3+0,1	17,7-17,9	0,5 (0,8)			
300	5,0-5,2	1,6-2,2	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600 VH =	19,2-20,8 max. 46°	600	20,0	10,3 4,0 1300	1095-1110 1165-1195 0-1,0	300	4,3	100 300 335-375	min. 5,8 4,2 - 4,4 = 2,0	-	-

Torque-control travel on flyweight assembly dimension a = 0 mm

Speed regulation: At 1095-1110 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA 1050	0,9 bar 177,0-179,0 (174,0-182,0)	-	LDA 600 LDA 500	0,9 bar 173,0-179,0 (170,0-182,0) 0 bar 141,0-143,0 (138,0-146,0)	100	150,0-170,0

Checking values in brackets

3.83

E16

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 10 P..LS 3824 + RQ..PA 656	0,90		11,3 - 11,4
		0	10,2 - 10,4
		0,41	10,9 - 11,1
		0,35	10,5 - 10,6

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 11,4 i
4. Edition
En

Testoil-ISO 4113

PES 6 P 120 A 820 LS 3077 RQ 300/1100 PA 585
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes 11.81
company: Daimler-Benz
engine: OM 407 LA
235 kW (320 PS)

Komb.-Nr. 0 402 046 722

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0-4,1 (3,95-4,15) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,4+0,1	21,2 - 21,4	0,5 (0,9)			
300	5,5-5,7	1,4 - 2,0	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check (1)		Full-load speed regulation Setting point		Test specifications (4)		Idle speed regulation Setting point		Test specifications (5)		Torque control (3)	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	19,2-20,8	650	20,0	12,4 4,0	1145-1160 1200-1230	300	4,9	100 300	min.6,5 4,8-5,0 370-410=2,0 mm	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery Idle speed (6)	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA 1100	0,70 bar 212,0 - 214,0 (209,0 - 217,0)	-	LDA 600 LDA 500	0,70 bar 205,0 - 211,0 (202,0 - 214,0) 0 bar 146,0 - 148,0 (143,0 - 151,0)	100	170,0 - 190,0

Checking values in brackets

3.83

E18

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P .. LS 3077 + .. PA 585	0,70	0 0,42 0,31	13,4-13,5 10,7-10,8 12,6-12,7 11,4-11,5

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 11,1 1 4
3. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 720 LS 360 RQ 250/1100 PA 335 DR (1)
RQV 250-1050 PA 373 DR (2)

supersedes 1.79
company: M A N
engine: D 2566 MTUH

(1 - 206 kW - 280 PS Nr. 7059)
(2 - 202 kW - 275 PS Nr. 7999)

6 - 2 - 4 - 1 - 5 - 3 ± 0,50
0 -60 -120-180-240-300° (± 0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) RW 9,0 - 12,0 mm; Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,1+0,1	14,6 - 14,8	0,4(0,8)	12,0+0,1	14,9 - 15,1	n = 1050
250	6,8-7,0	1,1 - 1,7	0,4(0,7)	6,8-7,0	1,1 - 1,7	
700/500	- - -	C	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in ▭.

B. Governor Settings

RQ.. 335 DR (1)

Checking of slider PRG check ① rev/min 1	Control rod travel mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
600	19,2-20,8	600	20,0	11,1	1145-1160	250	6,9	100	min. 8,5	1100	12,1-12,2
				4,0	1200-1230			250	6,8-7,0	1000	12,3-12,5
VH =	max. 46°			1350	0 - 1,0			370-410	=2,0	800	12,6-12,8
										700	12,8-12,9

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ Change-over point rev/min 6	Control rod travel cm³/1000 strokes / mm 7
(1) 1100	LDA 0,7 bar 146,0-148,0) (143,5-150,5)		LDA 500	0,2 bar 123,0 - 127,0 (120,0 - 130,0)	100	215,0 - 235,0
700	157,0-161,0 (154,0-164,0)		LDA 500	0 bar 111,0 - 113,0 (108,0 - 116,0)	100-170	(80-190)

Checking values in brackets

2.83

E20

B. Governor Settings

RQV... 373 DR (2) MAN 11,1 | 4

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel (1)	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min (1a) (2a)	Degree of deflection of control lever	rev/min	Control rod travel mm (4)	Degree of deflection of control lever	rev/min	Control rod travel mm (3)	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1050	15,2-17,8	-	-	-	ca.16	100	min.8,5	250	0,9-1,1
							250	6,8-7,0	800	5,3-5,5
							520- 580	=2,0	1150	8,3
ca.66	11,1	1090-1100								
	4,0	1205-1235								
	1400	0 - 1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min	cm^3/1000 strokes	rev/min	rev/min	cm^3/1000 strokes	rev/min	cm^3/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(2)	LDA 0,7 bar		LDA	0,2 bar			1100	12,0+0,1
1050	148,5-150,5	1090-1100*	500	123,0-127,0	100	215,0-2 5,0	850	12,2+0,2
	(146,0-153,0)			(120,0-130,0)				
700	153,0-157,0		LDA	0 bar			700	12,6+0,1
	(150,0-160,0)		500	111,0-113,0				
				(108,0-116,0)	100-170	(80-190)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel: XXXXXXX deviation XXXXXXX difference mm
360 + 335 DR	0,70		12,8 - 12,9
		0,32	12,2 - 12,4
		0,20	11,5 - 11,6
		0	10,9 - 11,0
360 + 373 DR	0,70		12,6 - 12,7
		0,32	12,2 - 12,4
		0,20	11,4 - 11,5
		0	10,9 - 11,0

En

E21

E21

Test Specifications Fuel Injection Pumps ② and Governors

PE 6 A 95 D 410 RS 2525 RQ 225/1200 AB 1156 L

supersedes

company: DAF

engine: DH 825

Specifications apply to test tubing 1 680 750 015

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	10,4+0,1	7,3-7,5	0,35(0,6			
225	5,7-5,9	0,6-1,0	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	19,2-20,8	650	20,0	9,4	1245-1260	225	6,1	100	min. 7,5	1200	10,4-10,5
VH=	max. 46°			4,0	1300-1330			225	6,0-6,2	650	11,1-11,2
				1400	0-1,0			345-385	=2,0	1035	10,7-10,9
								450	max. 1,0	1100	10,5-10,8

Torque-control travel on flyweight assembly dimension a = 0,25 mm

Speed regulation: At 1245-1260 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1200	73,0-75,0 (71,0-77,0)		800	74,5-77,5 (72,0-80,0	100	121,5-131,5 = 19,5-21,0 mm RW

Checking values in brackets

E22

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 6,1 K 2
2. Edition
En

PES 6 A 85 D 410 RS 2592 RQV 300-1250 AB 1158 L
Komb.-Nr. 0 400 846 497

supersedes 9.82
company: KHD
engine: BF 6 L 913
GMC vehicle
118 kW (160 PS)
/ 2500 min^{-1}

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,2-2,3 (2,15-2,35) mm (from BDC) 9,0-12,0 mm RW

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,5+0,1	8,4-8,5	0,3 (0,45)			
300	8,3-8,5	1,0-1,6	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/mn 1a 2a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 4 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3 9	Sliding sleeve travel 1: rev/min 10	mm 11
max.	1290	15,2-17,8	-	-	-	ca.17	100	min.10,2	250	0,5-0,8
							300	8,3-8,5	580	3,6-3,7
ca. 66	11,5	1290-1300							920	5,3-5,4
	4,0	1375-1405							1250	8,1
	1500	0 - 1,0				450-575 3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2: rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed 2b 4a: rev/min 3	Fuel delivery characteristics high idle speed 5a 5b: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point 6: rev/min 6	cm³/1000 strokes 7	Torque-control travel 5: rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1290-1300*	LDA	0,7 bar	100	102,0-112,0	1250	12,5+0,1
			800	80,5-82,5		19,0-	500	13,2+0,1
1250	83,5-84,5			(78,0-85,0)		21,0 mm RW	800	13,2+0,1
	(81,5-86,5)						1000	12,9+0,2
							1100	12,7+0,3
			LDA	0 bar				
			500	59,0-61,0				
				(56,5-63,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

E23

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 A..RS 2592 + RQV..AB 1158 L	0,70		13,2 - 13,3
		0	11,8 - 11,9
		0,48	12,8 - 12,9
		0,33	11,9 - 12,1

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Distributor-Type Fuel Injection Pump

WPP 001/4 STE 4,0a 3
2. Edition
En

Testoil-ISO 4113

VA 4/90 H 1200 CR 164
0 460 394 010

superseded 6.82
company Steyr
engine WD 408.40

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,3 mm ± 0,02 (± 0,04)

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	900	2,2-3,0	mm		
1 2 Supply pump pressure	900	4,8-5,3	kp/cm²		
1 3 Full-load delivery without charge-air pressure	1200	62,0-63,0	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1 4 Idle speed regulation	300	10,0-16,0	cm³/1000 strokes		3,0
1 5 Start (autom.)	100	mind. 75,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1280	31,0-39,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	590-700(560-730)	900	920-1050
	mm	Start	(1,9-3,3)	2,9-3,6(2,6-3,9)
2 2 Supply pump	rev/min	200	900	1200
	kp/cm²	1,5-2,0(1,3-2,2)	(4,6-5,5)	5,6-6,1(5,4-6,3)
Overflow delivery	rev/min	500		1200
	cm³/10 s	55-100(40-110)		55-100(40-110)

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1330-1400 (1310-1420)	0		
		1280		(30,0-40,0)	
		1200		(61,5-63,5)	
		900	60,0-62,0	(59,0-63,0)	
		500	56,0-60,0	(55,0-61,0)	
	Stop	1200	0		
Idle stop	Full	400-470 (380-490)	0		
		300		(9,0-17,0)	
	Start	100	mind. 75,0		
End stop					

3.83

F1

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
1980 by Robert Bosch GmbH Postfach 50 D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

F1

Angle to the stop-plate	Pre-setting dimensions
Pump α = 25 ± 4° β = 45 ± 8° γ = 30 − 8° δ = 60 + 8°	Pump Dimension IV = 3,5 mm Dimension V = 24,6 mm

F2

Test Specifications Distributor-Type Fuel Injection Pump

46

WPP 001/4 IHC 5, 8 q 5
2. Edition

En

VA 3/10 H 1200 CR 409
CR 409 P

0 460 303 156

supersedes company engine: IHC D 159/53 HP

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Testoil-ISO 4113

Pre-stroke setting 0,3 mm
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1 1 Timing device travel	1000	4,8-5,8	mm		
1 2 Supply pump pressure	1000	5,6-6,1	kp/cm²		
1 3 Full-load delivery without charge-air pressure	800	72,5-73,5	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1 4 Idle speed regulation	375	12,0-18,0	cm³/1000 strokes		3,0
1 5 Start	100	mind. 90,0	cm³/1000 strokes		
1 6 Full-load speed regulation	1300	26,0-34,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

		--	500	1000	1200
2 1 Timing device	rev/min	Start	1,0-2,0 (0,7-2,3)	(4,5-6,1)	6,1-6,8 (5,8-7,1)
	mm				
		200		1000	1200
2 2 Supply pump	rev/min	1,7-2,2 (1,5-2,4)		(5,4-6,3)	6,3-6,8 (6,1-7,0)
	kp/cm²				
Overflow delivery	rev/min	500			1200
	cm³/10 s	55-100 (40-110)			55-100 (40-110)

2 3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1340-1400	0		
		(1320-1420)			
		1300		(25,0-35,0)	
		1180	76,5-79,5	(75,5-80,5)	
		800		(72,0-74,0)	
		500	70,0-74,0	(69,0-75,0)	
	Stop	1200	0		
Idle stop	Full	420-470	0		
		(400-490)			
		375		(11,0-19,0)	
	Start	100	mind. 90,0		

F3

Angle to the stop-plate	Pre-setting dimensions
Pump α 25 ± 4° β 50 ± 8° γ 30 - 8° δ 60 + 8°	Pump Dimension IV - mm Dimension V 24,65 mm

F4

F4

Test Specifications Distributor-Type Fuel Injection Pump

En

WPP 001/4 IHC 5,8 q 4
2. Edition

Testoil-ISO 4113

VA 6/10 H 1200 CR 408
CR 408 P
0 460 306 250

supersedes 8.81
company IHC
engine D 358

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,3 mm
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings

	rev/min	Settings		Charge-air press kp/cm²	Difference in delivery cm³
1.1 Timing device travel	1000	4,1-4,9 mm	mm		
1.2 Supply pump pressure	1000	5,7-6,2	kp/cm²		
1.3 Full-load delivery without charge-air pressure	800	66,5-67,5	cm³/1000 strokes		2,5
Full-load delivery with charge-air pressure	--	--	cm³/1000 strokes		
1.4 Idle speed regulation	350	12,0-18,0	cm³/1000 strokes		3,0
1.5 Start	100	mind. 90,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1280	28,0-36,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min	600	1000	1200
	mm	1,3-2,3 (1,1-2,5)	(3,8-5,2)	5,2-5,9 (4,9-6,2)
2.2 Supply pump	rev/min	200	1000	1200
	kp/cm²	1,7-2,2 (1,4-2,5)	(5,5-6,4)	6,4-6,9 (6,2-7,1)
Overflow delivery	rev/min	500		1200
	cm³/10 s	55-100 (40-110)		55-100 (40-110)

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1320.1380 (1300-1400)	0		
		1280		(27,0-37,0)	
		1150	68,0-71,0	(67,0-72,0)	
		800		(66,0-68,0)	
		500	59,5-63,5	(58,5-64,5)	
	Stop	1200	0		
Idle stop	Full	500-550 (480-570)	0		
		350		(11,0-19,0)	
	Start	100	mind. 90,0		

2.83

F5

F5

Angle to the stop-plate	Pre-setting dimensions
Pump α 25 ± 4° β 51 ± 8° γ 30 - 8° δ 60 + 8°	Pump Dimension IV = - mm Dimension V = 24,65 mm

F6

F6

Test Specifications Distributor-Type Fuel Injection Pump

En

46

WWP 001/4 IHC 5,8 q 8
1. Edition

VA 6/10 H 1150 CR 87-3
0 460 306 260

supersedes -
company IHC
engine D 358

Testoil-ISO 4113

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers
Test Intructions and Test Equipment VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0.4 mm
Setting of the pointer at a stroke of 1 mm in relation to outlet "A".

1. Settings	rev/min	Settings		Charge-air press. kp/cm²	Difference in delivery cm³
1.1 Timing device travel	700	2,4-3,2	mm		
1.2 Supply pump pressure	700	4,9-5,4	kp/cm²		
1.3 Full-load delivery without charge-air pressure	700	69,5-70,5	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	400	16,0-22,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 70,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1200	36,0-44,0	cm³/1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min	500	700	1150
	mm	0,6-1,6(0,4-1,8)	(2,1-3,5)	5,2-5,9(4,8-6,2)
2.2 Supply pump	rev/min	200	700	1150
	kp/cm²	2,1-2,6(1,9-2,8)	(4,7-5,6)	6,6-7,1(6,4-7,3)
Overflow delivery	rev/min			
	cm³/10 s			

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm³/1000 strokes		Charge-air pressure kp/cm²
End stop	Full	1250-1300	0		-
		1200		(34,0-46,0)	
		1150	70,0-73,0	(69,0-74,0)	
		700		(69,0-71,0)	
		500	66,0-70,0	(65,0-71,0)	
	Stop	1150	0		
Idle stop	Full	530-580	0		
		400		(14,0-24,0)	
	Start	100	min.70,0		

F7

2.83

BOSCH

Angle to the stop-plate	Pre-setting dimensions
Pump $\alpha = 25 \pm 4°$ $\beta = 42 \pm 8°$ $\gamma = 30 - 8°$ $\delta = 60 + 8°$	Pump Dimension IV = 3,8 Dimension V = 24,65 mm

F8

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,0 b 1
3. Edition
En

Testoil-ISO 4113

VE 5/10 F 2400 L 45 (P)
0 460 405 005; 006

supersedes 6.82
company: VW/Volvo
engine: 069.3

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,14 mm ± 0,02 (0,04)

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	2,4-2,8	mm		
1.2 Supply pump pressure	1400	5,0-5,6	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1400	33,5-34,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	375	6,0-8,0	cm³/1000 strokes		2,5 (3,0)
1.5 Start	100	min.53,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2500	21,0-27,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	2400
	mm	1,3-2,1(1,0-2,4)	(1,9-3,3)	5,1-5,9(4,8-6,2)
2.2 Supply pump	n = rev/min	500		2400
	bar (kgf/cm²)	2,8-3,4		7,4-8,1
Overflow delivery	n = rev/min	500		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2650	max. 13,0		
	2500		(20,0-28,0)	
	2400	27,5-29,5	(26,2-30,8)	
	1400		(31,7-36,3)	
	750	23,0-26,0	(21,5-27,5)	
switch-off elect.	400	0		
Idle stop	500	max. 3,0		
	375		(4,0-12,0)	
End stop	400	min. 14,5		
	500	max. 21,5		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V
xxxxxxxxx rated voltage 12V.
test voltage

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,7-5,9
MS	1,7-1,9
SVS	max.3,0
A XK	18,5-20,5
B XL	9,0-12,5

Observations

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

F9

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 2,0 b
3. Edition
En

Testoil-ISO 4113

VE 5/10 F 2400 L 45-1 (P)
0 460 405 007; 008

superseded 6.82
company: VW/Volvo
engine: 069.3

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,14 mm ± 0,02 (0,04)

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1400	2,4-2,8	mm		
1.2 Supply pump pressure	1400	5,0-5,6	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1400	33,5-34,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	375	6,0-10,0	cm³/1000 strokes		2,5 (3,0)
1.5 Start	100	min. 53,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2500	21,0-27,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1400	2400
	mm	1,3-2,1(1,0-2,4)	(1,9-3,3)	5,1-5,9(4,8-6,2)
2.2 Supply pump	n = rev/min	500		2400
	bar (kgf/cm²)	2,8-3,4		7,4-8,1
Overflow delivery	n = rev/min	500		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2650	max. 13,0		
	2500		(20,0-28,0)	
	2400	27,5-29,5	(26,2-30,8)	
	1400		(31,7-36,3)	
	750	23,0-26,0	(21,5-27,5)	
switch-off mech.	2400	0		
elektr.	400	0		
Idle stop	500	max. 3,0		
	375		(4,0-12,0)	
End stop	400	min. 14,5		
	500	max. 21,5		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V
xxxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	--
KF	5,7-5,9
MS	1,7-1,9
SVS	max.3,0
A XK	18,5-20,5
B XL	9,0-12,5

Observations

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung.

F10

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 L4
1. Edition
En

Testoil-ISO 4113

VE 4/9 F 2400 R 66-9
0 460 494 117

supersedes -
company: VWW
engine: 086

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9-3,3	mm		
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	31,5-32,5	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	475	6,0-10,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2400
	mm	1,3-2,1 (1,0-2,4)	(2,4-3,8)	6,1-6,9 (5,8-7,2)
2.2 Supply pump	n = rev/min	600		2400
	bar (kgf/cm²)	2,8-3,4		7,0-7,6
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2800	max. 2,5		
	2600		(10,0-18,0)	
	2400	26,5-28,5	(25,2-29,8)	
	1500		(29,7-34,3)	
	600	19,5-22,5	(18,0-24,0)	
switch-off elect.	400	0		
Idle stop	1200	max. 5,0		
	600	max. 6,0		
	475		(4,0-12,0)	
End stop	400	min. 15,5		
	500	max. 21,5		

2.4 Solenoid	max. cut-in voltage	xxx min. 10 V
	terminal voltage	rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	2,5
* FH	1,8-2,4
AXK	18,4-20,4
BXL	9,6-12,7

Observations
*operating stroke (KSB)

BOSCH

Geschäftsbereich KH. Kundendienst Kfz-Ausrüstung
© 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

F11

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 b 1
2. Edition
En

Testoil-ISO 4113

VE 4/9 F 2400 R 66

0 460 494 048

superseded 6.82
company: VWW
engine: 1,6 L

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,9-3,3	mm		
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	31,5-32,5	cm³/1000 strokes		2,5 (0,3)
Full-load delivery with charge-air pressure	-		cm³/1000 strokes		
1.4 Idle speed regulation	415	6,6-10,0	cm³/1000 strokes		2,5 (0,3)
1.5 Start	100	min. 38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2400
	mm	1,3 - 2,1 (1,0-2,4)	(2,4-3,8)	6,1-6,9 (5,8-7,2)
2.2 Supply pump	n = rev/min	400		2400
	bar (kgf/cm²)	2,1-2,7		7,0-7,6
Overflow delivery	n = rev/min	500		2400
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2700	2,5-9,5	(2,0-10,0)	
	2600		(10,0-18,0)	
	2400	27,0-29,0	(25,7-30,3)	
	1500		(29,7-34,3)	
	600	19,5-22,5	(18,0-24,0)	
switch-off elect.	400	0		
Idle stop	1200	max. 3,0		
	600	max. 6,0		
	415		(4,0-12,0)	
End stop	400	min. 15,5		
	500	max. 21,5		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V; ~~test voltage~~ xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2 - 3,4
KF	5,7 - 5,9
MS	1,3 - 1,5
SVS	max. 2,5
FH *)	1,8 - 2,4
K	18,4 - 20,4
L	9,1 - 12,9

Observations

*operating stroke (KSB) -

F12

F12

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VMA 3,6 a
2. Edition

En

Testoil-ISO 4113

VE 6/11 F 2100 L 63

0 460 416 014

superseded 6.82
company: VM Cento
engine: HR 692 HT

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,2 mm ± 0,02 (0,04)

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1800	6,5-6,9	mm	0,65	
1.2 Supply pump pressure	1800	6,6-7,2	bar (kgf/cm²)	0,65	
1.3 Full-load delivery without charge-air pressure	600	36,0-40,0	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	47,5-48,5	cm³/1000 strokes	0,65	3,5
1.4 Idle speed regulation	450	10,0-14,0	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 42,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2400	22,0-30,0	cm³/1000 strokes	0,65	
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,65 bar	n = rev/min	1000	1500	1800	2100
	mm	2,1-2,9(1,8-3,2)	4,7-5,3(4,3-5,7)	6,0-7,4)	7,9-8,6(7,5-8,9)
2.2 Supply pump LDA= 0,65 bar	n = rev/min	400		2100	
	bar (kgf/cm²)	1,7-2,3		7,8-8,4	
Overflow delivery	n = rev/min	500		2100	
	cm³/10 s	55-138 (40-153)		55-138 (40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2700	max. 1,0		
	2450	9,0-15,0	(7,5-16,5)	0,65
	2400		(21,5-30,5)	0,65
	2100	43,9-46,9	(42,5-47,9)	0,65
	1500		(45,3-50,7)	0,65
	* 600	38,5-41,5	(37,3-42,7)	0,27
	600		(34,6-41,4)	0
switch-off	2100	0		
Idle stop	700	max. 1,0		0
	550	2,0-8,0	(0,5-9,5)	0
	450		(7,5-16,0	
End stop	350	min. 40,0		
	450	max. 45,0		

2.4 Solenoid — max. cut-in voltage xxx min. 10,0 V; rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	--
KF	6,3-6,5
MS	0,9-1,1
SVS	max. 2,2
+ FH	1,8-2,4
A XK	20,2-22,2
B XL	10,8-13,1

Observations

+ Manifold-pressure compensator stroke = 4,0 mm. Correction at the adjusting nut.(46)

F13

1.83

F13

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 FIA 1,7 h

1. Edition

En

Testoil-ISO 4113

VE 4/10 F 2050 R 124

0 460 404 031

supersedes

company: Fiat

engine: 8144-81

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,2 mm ± 0,02 (0,04)

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	6,7-7,1	mm	0,75	
1.2 Supply pump pressure	1500	6,1-6,7	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	43,5-44,5	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	61,5-62,5	cm³/1000 strokes	0,75	3,0
1.4 Idle speed regulation	350	12,5-16,5	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 60	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2200	22,0-28,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery	1500	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	600	1500	2050
LDA=0,75 bar	mm	2,4-2,8 (1,7-3,1)	(6,2-7,6)	8,6-9,4 (8,3-9,7)
2.2 Supply pump	n = rev/min	400	600	2050
LDA=0,75 bar	bar (kgf/cm²)	3,4-4,0	4,0-4,6	7,4-8,0
Overflow delivery	n = rev/min	600		2050
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2400	max. 1,5		0,75
	2300	max. 5,0		0,75
	2200		(20,5-29,5)	0,75
	2050	53,1-56,1	(51,9-57,3)	0,75
	1500		(59,3-64,7)	0,75
	* 800	54,5-55,5	(51,6-58,4)	0,2
	600		(40,6-47,4)	0
switch-off	2050	0		
Idle stop	350		(10,0-19,0)	
	450	max. 3,5		
	500	max. 2,0		
End stop	350	min. 55		
	450	max. 55		

2.4 Solenoid

max. cut-in voltage xxx min. 10 V

test voltage xxxxxxxxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,7-6,0
MS	1,2-1,4
SVS	3,2
A XK	25,0-27,0
B XL	9,8-13,1

Observations

* Manifold-pressure compensator stroke = 4,0 mm. Correction at the adjusting nut.(46)

1.83

F14

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VMA 3,6 a 1

1. Edition

En

Testoil-ISO 4113

VE 6/11 F 1900 L 63-1

supersedes-
company: VM-Motori
engine: HR 6 H

0 460 416 029

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,2 mm ± 0,02 (0,04)

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,8-4,2	mm	0,75	
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	42,3-43,3	cm³/1000 strokes	0	
Full-load delivery with charge-air pressure	1500	61,0-62,0	cm³/1000 strokes	0,75	3,0
1.4 Idle speed regulation	350	20,0-24,0	cm³/1000 strokes	0	3,0
1.5 Start	100	min. 40,0	cm³/1000 strokes	0	
1.6 Full-load speed regulation	2100	20,0-26,0	cm³/1000 strokes	0,75	
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device LDA=0,75 bar	n = rev/min	1000	1500	1850
	mm	0,9-1,7 (0,6-2,0)	(3,3-4,7)	5,6-6,4 (5,3-6,7)
2.2 Supply pump LDA=0,75 bar	n = rev/min	600		1850
	bar (kgf/cm²)	2,0-2,6		6,0-6,6
Overflow delivery	n = rev/min	600		1900
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press bar (kgf/cm²)
End stop	2200	max. 1,5	0,75
	2100	(18,5-27,5)	0,75
	2000	44,0-50,0 (42,5-51,5)	0,75
	1850	56,7-59,3 (55,3-60,7)	0,75
	1500	(58,8-64,2)	0,75
	* 600	46,2-47,2 (43,3-50,1)	0,3
	600	(39,4-46,2)	0
switch-off	1900	0	
Idle stop	350	(17,5-26,5)	
	400	7,5-12,5 (5,5-14,5)	
	450	max. 3	
End stop	400	min. 49	
	500	max. 44	

2.4 Solenoid: max. cut-in voltage xxx min. 10,0 V
max. xxxxxxxxxx rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	-
KF	6,3-6,6
MS	0,9-1,1
SVS	max. 4,3
A XK	20,2-22,2
B XL	13,0-16,4

Observations

* Manifold-pressure compensator stroke = 4,0 mm. Correction at the adjusting nut.(46)

F15

FA5

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 FOR 2,3 a

2. Edition

En

VE 4/10F 1800 R 14

0 460 404 001

supersedes 4.82
company: Ford
engine: CID 144

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,3 mm + 0,02 (0,04)

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1600	3,8 - 4,2	mm		
1.2 Supply pump pressure	1600	5,5 - 6,1	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1250	40,5 - 41,5	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation ·	425	14,0 - 18,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 70	cm³/1000 strokes		
1.6 Full-load speed regulation	2050	9,0 - 15,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1600	1800
	mm	0,5-1,5(0,3-1,7)	(3,3-4,7)	4,5-5,3(4,2-5,6)
2.2 Supply pump	n = rev/min	400		1800
	bar (kgf/cm²)	1,7-2,3		6,0-6,6
Overflow delivery	n = rev/min	500		1800
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2170-2260	0		
	2050		(8,0-16,0)	
	1900	31,0-37,0	(30,0-38,0)	
	1750	38,0-40,0	(36,7-41,3)	
	1250		(38,7-43,3)	
	800	37,5-40,5	(36,0-42,0)	
switch-off	1800	0		
Idle stop	600-700	0		
	425		(12,0-20,0)	
End stop	215	min. 70		
	285	max. 35		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V
test voltage xxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,7-5,9
MS	2,0-2,2
SVS	max. 4,2
A	7,7-12,7
B	8,7-11,9

Observations

For further details see overleaf

F16

BOSCH Geschäftsbereich KH Kundendienst KH-Ausrüstung
© 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

Set by means of notched plate
Setting of the upper notched plate at a plunger of 0,36 mm related to outlet "A".

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 FOR 2,3 b
2. Edition

En

Testoil-ISO 4113

VE 4/10F 1800 R 15
0 460 404 002

supersedes 4.82
company: Ford
engine: CID 144

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,3 mm ± 0,02 (0,04)

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1600	3,8-4,2	mm		
1.2 Supply pump pressure	1600	5,5-6,1	bar (kgf/cm²)		3,0
1.3 Full-load delivery without charge-air pressure	1250	40,5-41,5	cm³/1000 strokes		
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	425	14,0-18,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 70	cm³/1000 strokes		
1.6 Full-load speed regulation	2050	9,0-15,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-				

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1600	1800
	mm	0,5 - 1,5 (0,3-1,7)	(3,3-4,7)	4,5-5,3 (4,2-5,6)
2.2 Supply pump	n = rev/min	400		1800
	bar (kgf/cm²)	1,7-2,3		6,0-6,6
Overflow delivery	n = rev/min	500		1800
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2170-2260		0	
	2050		(8,0-16,0)	
	1900	31,0-37,0	(30,0-38,0)	
	1750	38,0-40,0	(36,7-41,3)	
	1250		(38,7-43,3)	
	800	37,5-40,5	(36,0-42,0)	
switch-off	1800	0		
Idle stop	600-700	0		
	425		(12,0-20,0)	
End stop	215	min. 70		
	285	max. 35		

2.4 Solenoid — max. cut-in voltage / test voltage

3. Dimensions

for assembly and adjustment

Designation	mm
K	-
KF	5,7-5,9
MS	2,0-2,2
SVS	max. 4,2
A	7,7-12,7
B	8,7-11,9

Observations

For further details see overleaf

F18

Set by means of notched plate
Setting of the upper notched plate at a plunger of 0,36 mm related to outlet "A".

⑥ Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 FOR 2,3 c
1. Edition

En

Testoil-ISO 4113

VE 4/10 F 1800 R 14-1
0460 404 005
VE 4/10 F 1800 R 15-1
0460 404 006

supersedes -
company: Ford
engine: 144 c/D

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,2 mm ± 0,02 (0,04) mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1600	3,8-4,2	mm		
1.2 Supply pump pressure	1600	5,5-6,1	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1250	40,5-41,5	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	425	14,0-18,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 70	cm³/1000 strokes		
1.6 Full-load speed regulation	2050	9,0-15,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1600	1800
	mm	0,5-1,5 (0,3-1,7)	(3,3-4,7)	4,5-5,3 (4,2-5,6)
2.2 Supply pump	n = rev/min	400		1800
	bar (kgf/cm²)	1,7-2,3		6,0-6,6
Overflow delivery	n = rev/min	500		1800
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2170-2260	0	
	2050	(8,0-16,0)	
	1900	31,0-37,0 (30,0-38,0)	
	1750	37,0-39,0 (35,7-40,3)	
	1250	(38,7-43,3)	
	800	39,5-42,5 (38,0-44,0)	
switch-off	1800	0	
Idle stop	425	(12,0-20,0)	
	630-690	0	
End stop	215	min. 70	
	285	max. 35	

2.4 Solenoid — max. cut-in voltage XXX min. 10 V
XXXXXXXXX rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,7-5,9
MS	2,0-2,2
SVS	max. 4,2
A XK	19,3-21,3
B XL	6,9-10,2

Observations

For further details see overleaf

F20

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

F20

Set by means of notched plate
Setting of the upper notched plate at a plunger of 0,36 mm related to outlet "A".

Test Specifications Fuel Injection Pumps and Governors

(1) WPP 001/4 FIA 13,8 n 1
1. Edition

En

PE 8 P 120 A 920/5 LS 3812 RQV 300-1050 PA 475

1-8-4-3-6-5-7-2 je 45 ° ± 0,5 ° (± 0,75 °)

supersedes
company Fiat
engine: 8281.22.050

Komb.-Nr.
0 401 848 749

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,9+0,1	20,7-21,1	0,5(0,9)			
300	4,9-5,1	1,7-2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1080	15,2-17,8	-	-	-	ca.10	100 300	min. 7,5 5,9-6,1	300 450 800	1,6-1,7 3,5-4,2 6,1-6,3
ca. 60	9,9 4,0 1300	1090-1100 1180-1210 0 - 1,0				310-415 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1050	0,7 bar 207,0-211,0 (204,0-214,0)	1090-1100*	LDA 1050	0 bar 149,0-153,0 (145,5-156,5)	100	230,0-250,0 (226,0-254,0)	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH
Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

F22

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE 8 P .. LS 3812 + RQV .. PA 475	0,70	0 0,30 0,25	10,9-11,0 8,5-8,6 10,4-10,5 9,1-9,4

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

(2) WPP 001/4 3. Edition MB 17,4a

En

Testoil-ISO 4113

PE 10 P 100 A 320 LS 842 RQ 300/1150 PA 187-1 R

supersedes 2.80

company: Daimler Benz

engine: OM 403 235,4 kW (320 PS)

10- 9- 4- 1- 8- 7- 6- 3- 5- 2 ±0,50°
0-45-72-117-144-189-216-261-288-333 (0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,40-3,50 (3,35-3,55) mm (from BDC) Zy1.10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,4-11,5	10,1 - 10,3	0,3(0,6)			
300	8,0-8,2	1,4 - 2,0	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider PRG check (1)		Full-load speed regulation			(4)	Idle speed regulation				Torque control (3)	
		Setting point		Test specifications		Setting point		Test specifications (5)			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	13,8-14,6	650	14,2	10,4	1195-1210	300	8,1	100	min.10,6	1150	11,4-11,5
1350	0-1			4,0	1245-1275			300	8,0-8,2	600	11,4-11,6
								425-465=2,0			

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1195-1210 min^{-1} 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery Idle speed (6)	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes / Control rod travel mm 7
1150	101,0 - 103,0 (99,0 - 105,0)	600	-	-	100	125,0 - 1 5,0

Checking values in brackets

2.83

F24

Testoil-ISO 4113

PE 10 P 110 A 520/4 LS 846 RQ 250/1150 PA 561

superseded 2.82
company MAN
engine D 2540 MT
323 kW (439 PS)

1 - 8 - 7 -6 - 3 - 5 - 2 - 10- 9 - 4
0 - 27 - 72-99-144-171-216-243-288-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9+0,1	14,0 - 14,2	0,4 (0,8			
250	6,9-7,1	1,1 - 1,7	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	19,2-20,8	600	20,0	10,9	1195-1210	250	7,0	100	min.8,5	1150	11,9-12,0
VH = max. 46°				4,0	1300-1330			250	6,9-7,1	600	11,9-12,1
				1450	0 - 1,0			350-390 = 2,0 mm			

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1195-1210 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes / Control rod travel mm 7
LDA 1150	0,9 bar 140,0 - 142,0 (137,0 - 145,0)	-	LDA 750	0,9 bar 134,0 - 138,0 (131,0 - 141,0)	100	145,0 - 175,0
			LDA 500	0 bar 115,0 - 118,0 (112,0 - 121,0)		

Checking values in brackets

2.83

G1

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE10P..LS 846 + .. PA 561	0,9	0 0,38 0,33	11,9 - 12,0 11,1 - 11,2 11,7 - 11,8 11,3 - 11,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

G2

En G2

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 FIA 13,8 o
4. Edition
En

Testoil-ISO 4113

PE 8 P 120 A 920/5 LS 3804 RQ 300/950 PA 474

supersedes 2.82
company: Fiat
engine: 8280.22.007

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2 je 45° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5 - 3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	10,9+0,1	20,5 - 20,9	0,5(0,9)			
300	4,9-5,1	1,9 - 2,5	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel rev/min 1	mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
600	19,2-20,8	600	20,0	9,9	995-1010	300	5,0	100	min. 7,5	950	11,1-11,2
VH:	max. 49°			4,0	1030-1060			300	4,9-5,1	600	11,1-11,3
				1150	0 - 1,0			350-390	=2,0mm		

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 995-1010 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA	0,7 bar	-	LDA	0 bar	100	19,5-21,0 mm RW
950	205,0-209,0 (202,0-212,0)		950	149,0-153,0 (146,0-156,0)		

Checking values in brackets

2.83

G3

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 8 P.. LS 3804 + ..PA 474	0,70	0 0,35 0,28	10,9 - 11,0 8,3 - 8,4 10,3 - 10,4 9,0 - 9,3

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 FIA 13,8 p
3. Edition

En

PE 8 P 120 A 920/5 LS 3804 RQ 300/1200 PA 356 R
1-8-4-3-6-5-7-2 je 45 ° ± 45 ° ± 0,50 (± 0,75 °)
Komb.-Nr. 0 401 848 719
0 401 848 715

supersedes 2.81
company: Fiat
engine: 8280.02.405

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3-17,7	0,5(0,9)			
300	5,9-6,1	2,8-3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	15,6-16,4	650	16,0	8,3	1245-1260	300	6,0	100	min. 7,5	1200	9,3-9,4
				4,0	1280-1310			300	5,9-6,1	650	9,3-9,5
				1400	0 - 1,0			400-	440 = 2,0		

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1245-1260 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1200	173,0-177,0 (170,0-180,0)	-	-	-	100	19,5-21,0

Checking values in brackets

2.83

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 RAB 9,7 b

1. Edition

En

PES 6 A 95 D 420 LS 2595 RQ 200/1100 AB 1094-1 R

Komb.-Nr. 0 400 846 514

supersedes

company: RABA

engine: D 2356 HM 6 U
162 kW

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	12,1-12,3	0,3(0,6)			
200	6,0-6,2	0,8-1,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
			Control rod travel	Control rod travel			Control rod travel		Control rod travel		Control rod travel
rev/min 1	mm 2	rev/min 3	mm 4	mm 5	rev/min 6	rev/min 7	mm 8	rev/min 9	mm 10	rev/min 11	mm 12
550 VH =	19,2-20,8 max. 46°	550	20,0	10,3 4,0	1145-1160 1175-1205	200	6,0	100 200 290-350	min.7,5 5,9-6,1 330=2,0 max.1,0	1100 500 750 855	11,3-11,4 12,0-12,1 11,7-11,9 11,5-11,7

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes mm 7
1100	121,0-123,0 (119,0-125,0)	500	800	122,0-125,0 (119,5-127,5)	100	17,5-18,1
			500	max. 117,0 (max. 119,0)		

Checking values in brackets

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

G6

Test Specifications Fuel Injection Pumps and Governors ②

WPP 001/4 MAN 17,4 b
1. Edition
En

PE 10 P 110A520/5 LS 850 RQ 750 PA 404-3

supersedes
company: MAN
engine: D 2540 MTE
235 kW (320 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,9+0,1	15,2-15,4	0,4(0,8)			
250	6,9-7,1	1,1-1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ① rev/min 1	Control rod travel mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
-	-	-	-	11,9 6,6 900	750-755 780-790 0 - 1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: AI 750-755 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ② rev/min 1	cm³/–1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/–1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel mm cm³/1000 strokes 7
700	152,0-154,0 (149,0-157,0)	-	-	-	100	19,5-21,0

Checking values in brackets

1.83

G7

G7

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MAN 11,1 q 10
1. Edition
En

PES 6 P 110 A 720 LS 375 RQ 750 PA 638

Komb.-Nr. 0 402 046 237

supersedes_
company: MAN
engine: D 2566 MTE
147 kW

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95-3,15) mm (from BDC) Zyl. 6 = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,5+0,1	15,6-15,8	0,4 (0,8)			
250	6,7-6,9	1,0-1,6	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ① Control rod travel rev/min 1	mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
-	-	-	-	11,5 4,0 900	750-755 780-790 0-1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel mm 7
700	156,0-158,0 (153,0-161,0)	-	-	-	100	19,5-21,0

Checking values in brackets

3.83

G8

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 16,0c

7. Edition

En

Testoil-ISO 4113

PE 10 P 100 A 320 LS 811 RQ 300/1250 PA 187 R

supersedes 6.80

company: Daimler-Benz

engine: OM 403

1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4

0 - 27 - 72 - 99 - 144 - 171 - 216 - 243 - 288 - 315° ± 0,5° (± 0,75°)

Komb.- Nr.
0 401 849 133

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,40-3,50 (3,35-3,55) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,1 +0,1	10,0 - 10,2	0,3(0,6)			
300	7,4-7,6	1,8 - 2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation				Idle speed regulation				Torque control ③	
		Setting point		Test specifications ④		Setting point		Test specifications ⑤			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	13,8-14,6	650	14,2	9,1 4,0 1450	1295-1310 1335-1365 0 - 1,0	300	7,5	100 300 405-445=2,0	min. 9,0 7,4-7,6	1250 650	10,1-10,2 10,1-10,3

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1250	100,0 - 102,0 (98,0 - 104,0)	600	600	77,0 - 82,0 (75,0 - 84,0)	100	110 - 130

Checking values in brackets

2.83

G9

PE6P100A720RS5 RO 250/1100 PA 9 DR

supersedes –
company: Daimler-Benz
engine: OM 355
154,5 kW (210 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,75-2,95) mm (from BDC) RW 9,0- 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1090	12,0+0,1	9,9-10,1	0,3(0,6)			
250	7,9-8,1	1,7-2,3	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	11,0	1145-1160	250	6,0	100	min.7,5	1090	12,0-12,1
				4,0	1185-1215			250	5,9-6,1	450	12,6-12,7
				1350	0 - 1,5			385-425	= 2,0	700	12,4-12,6

Torque-control travel on flyweight assembly dimension a = 0,2 mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1090	99,0-101,0 (97,0-103,0)	–	450	88,0-92,0 (86,0-94,0)	100	150,0-170,0
			700	98,0-102,0 (96,0-104,0)		

Checking values in brackets

2.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

G10

Test Specifications Fuel Injection Pumps and Governors ②

WPP 001/4 MB 11,4 r
1. Edition
En

PES 6 P 110 A 820 LS 459 RQ 350/1050 PA 655
Komb.-Nr. 0 402 046 248

supersedes
company Daimler-Benz
engine: OM 407 h

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2-3,3 (3,15-3,35) mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	9,5-9,6	9,9-10,1	0,4(0,8)			
350	6,6-6,8	1,4-2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,1-13,9	600	13,5	8,5 4,0 1250	1095-1100 1145-1175 0 - 1,0	350	6,7	100 350 370-410	min. 8,1 6,6-6,8 = 2,0	1050 900 600	9,5-9,6 9,7-9,9 10,3-10,5

Torque-control travel on flyweight assembly dimension a = 0,4 mm

Speed regulation: At 1095-1100 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1050	99,0-101,0 (96,0-104,0)	-	600	90,0-94,0 (87,0-97,0)	100	130,0-150,0

Checking values in brackets

2.83

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

G11

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 8,3 c 4
2. Edition

En

PE 6 A 90 D 410 RS 2124 RQ 300/1250 AB 812 DL

supersedes 9.82
company: Daimler-Benz
engine: OM 360
141 kW (192 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,2+0,1	8,6 - 8,7	0,3 (0,45)			
300	6,3-6,5	1,2 - 1,8	0,2 (0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel rev/min 1	mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
700	15,6-16,4	700	16,0	9,2 4,0	1295-1310 1345-1375	300	6,4	100 300 370-410 500	min.7,9 6,3-6,5 = 2,0 max.1,0	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1295-1310 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1250	86,0-87,0 (84,0-89,0)	-	800	80,0-83,0 (78,0-85,0)	100	19,0-21,0 mm RW

Checking values in brackets

3.83

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung.

G12

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BAO 10,6 a
1. Edition

En

PES 4 P 120A 320 RS 451 RQV 350-900 PA 618

supersedes
company: Baudouin
engine: DNP 4
107 kW (145 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 -2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,0+0,1	17,6-18,0	0,5(0,8)			
350	7,2-7,4	2,2-2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	940	15,2-17,8	-	-	-	ca. 30	100 350	min. 8,8 7,2-7,4	300 500 700 900	0,7-1,0 3,2-3,8 5,5-5,9 8,0
ca. 59	10,0 4,0 1150	940-950 990-1020 0 - 1,0				350-440 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
900	176,0-180,0 (173,0-183,0)	940-950*	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

G13

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

G13

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 OMB 8,1d
2.Edition
En

Testoil-ISO 4113

PES 6 MW 100/720 RS 1012 RQV 425-1100 MW 36
0 403 446 127

supersedes 82
company OM-Brescia
engine: 8365.25.580
129 kW (175 PS)

1 - 5 - 3 - 6 - 2 - 4
0 - 60 - 120 - 180 - 240 - 300 ± 0,5(0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,90-3,00 (2,85-3,05) mm (from BDC) RW 10,5 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,5+0,1	9,6 - 9,8	0,35(0,6)			
425	5,8-6,0	1,15 - 1,55	0,35(0,55)			
700	12,4+0,1		0,5 (0,7)			
500	11,2+0,1		0,35(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 14	425	5,8-6,0		
	1300	0 - 1,0					100	min.7,5		
ca.49	10,5	1140-1150					470-530=	2,0		
	4,0	1185-1215				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,5 bar		LDA	0,5 bar			700	12,4+0,1
1100	96,0-98,0 (94,0-100,0)	1140 - 1150 *	700	101,0-105,0 (99,0-107,0)	100	RW max.19 min.160,0	1000	11,5+0,1
			LDA	0 bar				
			500	75,0-77,0 (73,0-79,0)	100-220 (80-240)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

G14

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 /min decreasing ~~increasing~~ pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1012 + RQV-MW 36	0,27		12,1 - 12,2
		0,2	11,5 - 11,7
		0,5	12,4 - 12,5
		0	11,2 - 11,3

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

G15

GAS
En

Test Specifications Fuel Injection Pumps and Governors

(1) WPP 001/4 MAN 20,9c

3. Edition En

Testoil-ISO 4113

PE 12 P 120 A 520 LS 836 RQV250-1150PA353R

supersedes 80

compat. MAN

engine D2542MLE

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7

0 - 45 -60 -105-120-165-180-225- 240-285 - 300-345° ±0,5° (±0,75°) 478,0 (650 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10 (2,95-3,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,3-11,4	18,5 - 18,8	0,5(0,9)			
250	6,7-6,9	2,2 - 2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.11	100	min.8,3	200	0,6-0,9
	1450	0 - 1,0					250	6,7-6,9	520	3,2-3,7
									830	5,7-6,0
									1150	8,1
ca.66	10,3	1190-1200					520-580	=2,0		
	4,0	0 - 1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1150	185,0-188,0 (182,0-191,0)	1190-1200*			100	200,0-220,0		
					100-170	(80-190)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© By Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

G16

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BAO 13,2 a
1. Edition
En

PES 5 P 120 A 320 RS 452 RQV 350-900 PA 618
1 - 2 - 4 - 5 - 3 je 72° ± 0,5° (± 0,75°)

supersedes
company: Baudouin
engine: DNP 5
132 kW

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,0+0,1	17,6-18,0	0,5 (0,8)			
350	7,2-7,4	2,2-2,8	0,8 (0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	940	15,2-17,8	-	-	-	ca.30	100	min.7,5	300	0,7-1,0
							350	7,2-7,4	500	3,1-3,8
ca.59	10,0	940-950							700	5,5-5,9
	4,0	990-1020				350-440			900	8,0
	1150	0-1,0								
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
900	176,0-180,0 (173,0-183,0)	940-950*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

2.83

G17

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 20,9 q

En 1. Edition

PE 12 P 110 A 520/4 LS 848 RQV 250-1200 PA 644

supersedes

company MAN

engine: D 2842 ME 338 kW

1- 5- 9- 8- 3 - 4 - 11- 10- 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr.
0 401 840 078

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	11,9+0,1	12,5-12,7	0,4(0,8)			
250	7,0-7,2	0,9-1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1230	15,2-17,8	-	-	-	ca.12	100	min.8,6	315	1,6-1,9
							250	7,0-7,2	950	5,1-5,3
ca. 61	10,9	1240-1250							1200	7,5
	4,0	1365-1395				425-550 ③a				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
1200	125,0-127,0 (122,0-130,0)	1240-1250*	-	-	100	150,0-170,0 (146,0-174,0)	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

G18

Test Specifications Fuel Injection Pumps ① and Governors

WPP001/4 KHD 4,7 b
2. Edition

En

PES 5 A 80 D 410/3 RS 2579 RQV 300-1400 AB 1048 DL

supersedes 9.82
company: KHD
engine: F 5 L 912
74 kW (101 PS)
bei 2800 min⁻¹

1-3-5-4-2 je 72° ±0,5° (±0,75°)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9-2,0 (1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 8
1400	11,4+0,	6,1-6,2	0,2(0,35)			
300	8,9-9,	1,0-1,6	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1400	15,2-17,8	-	-	-	ca.10	100	min.7,5	250	0-0,6
							300	5,9-6,1	630	2,9-3,1
ca. 60	10,4	1480-1490					750	max. 1,0	1020	5,0-5,3
	4,0	1710-1740				390-490			1400	5,9
	1850	0-1,0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/mn 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
1400	62,5-63,5 (61,0-65,0)	1480-1490*	900	59,5-61,5 (57,5-63,5)	100	120,0-130,0 bei 20,5-21,5 mmRW	1400	11,4+0,
			750	56,5-58,5 (55,0-60,0)			1075	11,5+0,3
							825	12,0+0,2
							500	12,4+0,

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

G19

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

GA9

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 PEN 10,0 d 1
1. Edition
En

PE 6 P 110 A 320 RS 138 RSV 200-900 P 1/305 R
Komb.-Nr. 0 401 876 104

supersedes -
company Volvo-Penta
engine MD 100 B
114 kW (155 PS)

Testöl-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 - 2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	9,3-9,4	10,9-11,1	0,4 (0,8)			
225	5,4-5,5	1,0-1,4	0,3 (0,6)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 23	225	5,0	-	-
	x = 6,0						100	min.20,0		
ca.48	8,3	940-950					225	5,4-5,5		
(2a)	4,0	970-1000					310-370	= 2,0		
	1100	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note: changed to ..) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
700	109,0-111,0 (106,0-114,0)	940-950*	-	-	100	310,0-330,0 = RW 20,0-21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

G20

Test Specifications Fuel Injection Pumps and Governors

(1A)

40

WPP 001/4 VAL 3,3a
2. Edition

En

PES3A95D 320 RS 2655 RSV 325-1150 A 2 B 2178-1R

supersedes 11.82
company Valmet
engine 311 DS 6

1 - 2 - 3 je 120 ° ± 0,5 ° (±0,75 °)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	10,0+0,1	8,3 - 8,5	0,3 (0,6)			
325	7,0-7,2	0,9 - 1,5	0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed rev/min 8	Control rod travel mm 9	(3) Torque control rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0 X = 6,0	-	-	-	ca. 28	325	6,7	1150	10,0-10,1
							100	min.19,5	500	11,3-11,4
ca. 54 (2a)	9,0	1190-1200					325	7,1-7,3	915	10,6-10,8
	4,0	1290-1320					650-710	= 2,0		
	1455	0,3 -1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F) rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat Note: changed to ...) rev/min 3	(3a) Fuel delivery characteristics rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle rev/min 6	cm³/1000 strokes 7	(4a) Idle stop rev/min 8	Control rod travel mm 9
1150	82,5-84,5 (80,5-86,5)	1190-1200*	500	83,0-86,0 (81,0-88,0)	100	171,0 - 181,0 = 19,5-21,5 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

G21

G21

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 PEN 10,0 b 1
1. Edition
En

PE 6 P 100 A 320 RS 101 y RSV 200-900 P 4/305 R

Komb.-Nr. 0 401 876 263

supersedes company Volvo-Penta engine TD 100 A/PP 154 kW (209 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 - 2,7 (2,55-2,75) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,0+0,1	13,6 - 13,8	0,3(0,6)			
200	5,5-5,7	1,1 - 1,5	0,2(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed: 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 18	200	5,1	-	-
	x = 4,0						100	min.20,0		
							200	5,5-5,7		
ca. 51 (2a)	11,0	940-950					260-320	= 2,0		
	4,0	970-1000								
	1135	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to: rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	(5) cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
700	136,0-138,0 (133,0-141,0)	940-950 *	-	-	100	230,0-260,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

G22

G22

Test Specifications Fuel Injection Pumps and Governors

40

(1A) WPP 001/4 MWM 14,4 a 1
1. Edition
En

PE 8 P 120 A 520/5 RS 427 RSUV 300-750 P 10 A 320

supersedes: -
company: MWM
engine: D 234-V 8

1- 8-5 -4 - 7 - 2 - 3 - 6
0-30-90-120-180-210-270-300 ° ± 0,5 ° (± 0,75 °)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	9,7-9,8	17,1-17,5	0,5 (0,9)			
300	6,5-6,7	2,8-3,6	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4 5 6	(4) Control-lever deflection in degrees 7	Lower rated speed: rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	- . -	ca.21	300	6,1	750	9,7-9,8
	x = 2,75				300	6,5-6,7	450	9,7-9,8
ca. 55	8,7	790-8 0			320-380 = 2,0		320	10,9-11,5
(2a)	4,0	800-830						
	950	0,3-1,7						

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note: changed to) rev/min 3	(3a) Fuel delivery charactenstics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
750	171,0-175,0 (168,0-178,0)	790-800*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

BOSCH Geschaftsbereich KH Kundendienst Kfz-Ausrustung

G23

G23

Test Specifications Fuel Injection Pumps and Governors

40

(1A) WPP 001/4 MB 11,4 1 6
1. Edition
En

PES 6 P 110 A 820 LS 442-1 RSV 350-1100 P 0/485

supersedes -
company Daimler-Benz
engine OM 407
177 kW (241 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 (3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,7+0,1	12,5-12,7	0,4 (0,8)			
350	7,8-8,0	1,4-2,0	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	-	-	-	-	-
	x	= 3,0								
ca. 48 (2a)	10,7	1140-1150								
	4,0	1220-1250								
	1250	0,3-1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to) rev/min 3	(3a) Fuel delivery charactenstics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1100	125,0-127,0 (122,0-130,0)	1140-1150*	600	117,0-121,0 (114,0-124,0)	100	140,0-160,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

BOSCH Geschaftsbereich KH Kundendienst Kfz-Ausrustung

G24

G24

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 DAF 11,6 D
1. Edition
En

PE 6 P 120 A 320 RS 443 RSV 250-1100 P 5/458 R

supersedes -
company DAF
engine DKS 1160
235 kW (320 PS)

See service Information VDT-I-DAF 004

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75 - 2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	10,9+0,1	19,1-19,5	0,5(0,9)			
250	6,2-6,4	1,1-1,5	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Control-lever deflection in degrees 7	Lower rated speed: rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 24	250	5,8	400	11,1-11,2
	x = 5,0						250	6,2-6,4	300	11,3-11,8
ca. 54 (2a)	9,9	1140-1150					620-680	= 2,0		
	4,0	1260-1290								
	1425	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle: rev/min 6	cm³/1000 strokes (5) 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1140-1150*	LDA	0 bar	100	315,0-355,0	-	-
850	191,0-195,0 (188,0-198,0)		600	133,0-137,0 (130,0-140,0)		= 19,5 - 21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

H1

H1

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 600 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P..RS 443 + RSV..P 5/458 R	0,36	0,70 0 0,28	10,6 - 10,7 10,9 - 11,0 9,8 - 9,9 10,0 - 10,2

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

H2

En H2

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4FOR 40
5,9 f 2
1. Edition

En

PES 6 A 90 D 210 RS 2629 RSV 350-1300 A0B 2143 L

supersedes -
company Ford
engine Dover 363

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

At port closing the locating pin must engage in the slot of the pointer.

Port closing at prestroke 2,7-2,8 (2,65-2,85) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,7+0,1	5,9-6,0	0,3(0,45			
350	7,2-7,4	0,7-1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 40	350	6,8	1250	11,7-11,8
	x =	3,5					100	min.19,0	700	11,9-12,0
ca.71	10,7	1370-1380					350	7,2-7,4		
(2a)	4,0	1515-1545					580-640	= 2,0		
	1680	0,3-1,7					700	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note changed to): rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1250	58,5-59,5 (56,5-61,5)	1370-1380*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

2.83

H3

H3

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 18,3 d
2. Edition
En

Testoil-ISO 4113

PE 10 P 110 A 320 LS 3818 RQV 300-1150 PA 486-2

1 - 8 - 7 - 6 - 3 - 5 - 2 - 10- 9 - 4
0 -27 -72 -99 -144-171-216-243-288-315° ± 0,5° (± 0,75°)

supersedes 82
company Daimler-Benz
engine OM 423
26i kW (355 PS)
Komb.-Nr. 0 401 849 706

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BCC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,1+0,1	12,5 - 12,7	0,4(0,8)			
300	8,5-8,7	1,4 - 2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min / Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 19	100	min.10,2	250	1,0-1,2
							300	8,5-8,7	550	3,4-3,7
ca. 65	11,1	1190-1200							850	4,9-5,3
	4,0	1240-1270				330-470			1150	7,6
	1400	0 - 1,0				(3a)				

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery, Control-rod stop, Test oil temp 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation, intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9	
1150	125,0-127,0 (122,0-130,0)	1190-1200 *	600	115,0-119,0 (112,0-122,0)	100	130,0-150,0	1150	12,1+0,1	1
							600	12,5+0,1	1
			900	116,0-121,0 (113,0-124,0)			900	12,4+0,2	2

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

H4

BOSCH Geschäftsbereich KH Kundendienst KDz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 30 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H4

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 16,0 i

3. Edition

En

PE 10 P 100 A 320 LS 811 RQV 300-1250 PA 227 R

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4

0-27-72-99-144-171-216-243-288-315 ° ± 0,5 ° (± 0,75 °)

superseded 3.82

company Daimler-Benz

engine OM 403
Komb.-Nr.
0 401 849 136

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4-3,5 (3,35-3,55) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,3+0,1	10,0-10,2	0,3(0,6)			
300	7,4-7,6	1,8-2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca. 12 (3a)	100	min. 9,0	250	0,7-1,0
							300	7,4-7,6	580	3,4-3,7
ca.66	9,3	1290-1300					630-690	= 2,0	920	5,2-5,6
	4,0	1330-1360							1250	8,0
	1450	0 - 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1250	100,0-102,0 (98,0-104,0)	1290-1300 *	600	78,0-83,0 (76,0-85,0)	100	120,0-140,0		

Checking values in brackets

* 1 mm less control rod travel than col 2

2.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1 Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H5

Test Specifications Fuel Injection Pumps ① and Governors

Fiat 13,8k
3. Edition

En

Testoil-ISO 4113

PE 8 P 120 A 920/5 LS 3804 R/V300 -1200 PA 357 R

supersedes 2.81
company Fiat
engine 8280.02.183
257 kW (350 PS)

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2
0 -45 -90 -135-180-225-270-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,45-3,65) 3,50-3,60 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3 - 17,7	0,5(0,9)			
300	5,9-6,1	2,8 - 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1200	15,2-17,8				ca. 10	100 300	min.7,5 5,9-6,1	300 800 1200	1,4-1,5 5,2-5,5 8,3
ca. 63	8,3 4,0 1450	1240-1250 1315-1345 0 - 1,0				340-445 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm 9
1200	173,0-177,0 (170,0-180,0)	1240-1250*			100	19,5-21,0 mm DV		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.93

HC

Test Specifications Fuel Injection Pumps and Governors

NPP 001/4 FIA 13,8 m
5. Edition
En

Testoil-ISO 4113

PE 8 P 120 A 920/5 LS 3804 RQV 300-950 PA 475

superseded 11.82
company Fiat
engine 8285.22

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2
0 -45 -90 -135-180-225-270-315 ± 0,5°(±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,45-3,65) 3,50-3,60 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	11,1+0,1	20,7 - 21,1	0,5(0,9)			
300	4,9-5,1	1,5 - 2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel (1b) mm rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	950	15,2-17,8	-	-	-	ca.11	100	min.7,5	300	2,0-2,1
							300	5,9-6,1	400	3,1-3,5
ca. 64	10,1	990-1000					300-390=2,0		1000	8,3
	4,0	1075-1105								
	1250	0 - 1,0								
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2) rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) rev/min (4a) 3	Fuel delivery characteristics high idle speed (5a) (5b) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel (3) rev/min 8	Control rod travel mm 9
LDA 950	0,7 bar 207,0-211,0 (204,0-214,0)	990-1000*	LDA 950	0 bar 142,0-146,0 (139,0-149,0)	100	19,5-21 mmRW Electromagnet 24V		

Checking values in brackets

* 1 mm less control rod travel than col 2

2.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1 · Postfach 50 · Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H7

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure
XXXXXX

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
.. LS 3804 + RQV..PA 475	0,7	0,35 0,28 0	11,1 - 11,2 10,4 - 10,5 9,0 - 9,3 8,3 - 8,4

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

H8

n H8

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 I
3. Edition

Testoil-ISO 4113

PE 8 P 120 A 920/5LS 3804 RQV300-1050PA475

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2
0 - 45 - 90 - 135 - 180 - 225 - 270 - 315 ± 0,5 (0,75)°

supersedes 3.81
company Fiat
engine 8285.22.002
243 kW (330 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,45 - 3,65) / 3,50 - 3,60 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,9	20,2 - 20,6	0,5(0,9)			
300	+ 0,1 5,9-6,1 -	2,8 - 3,6 c.Sp. 4-5	0,8(1,2)			
1050			0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
ca. 68	1050 1350	15,2-17,8 0 - 1				ca. 11 (3a)	100 300	min. 7,5 5,9- 6,1	300 700 1050	1,4-1,5 5,4-5,6 8,0
ca. 64	9,9 4,0	1090-1100 1185-1215					320-420 = 2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1050	0,7 bar 202,0-206,0 (199,0-209,0)	1090-1100*	LDA 1050	0 bar 162,0-166,0 (159,0-169,0)	100	19,5-21 mm³/H Magnet 24 V		
					300	28,0-36,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
3804 + 475	0,7 bar	0,36 0,30 0	10,9 - 11,0 10,6 - 10,7 9,7 - 9,9 9,3 - 9,4

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 L 2
1. Edition
En

PE 8 P 120 A 920/5 LS 3804 RQV 300-1050 PA 565

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2 je 45 ° ± 0,5 ° (± 0,75 °)

Komb.-Nr. 0 401 848 710

supersedes
company: Fiat
engine: 8285.22.002
243 kW (330 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,9+0,1	20,2-20,6	0,5(0,9)			
300	5,9-6,1	2,8-3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1050	15,2-17,8	-	-	-	ca. 11	100 300	min. 7,5 5,9-6,1	250 520 780 1050	0,4-0,7 4,1-4,8 5,8-6,0 8,0
ca. 64	9,9 4,0 1350	1090-1100 1185-1215 0 - 1,0				320-420 (3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1090-1100 *	LDA	0 bar	-	-	-	-
1050	202,0-206,0 (199,0-209,0)		1050	162,0-166,0 (159,0-169,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH
Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

HM

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel – diminution difference mm (1)
PE 8 P ..LS 3804 + RQV..PA 565	0,36	0,70 0 0,30	10,6-10,7 10,9-11,0 9,3-9,4 9,7-9,9

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 7,0 k
2. Edition
En

Testoil-ISO 4113

PE 6 P 110 A 320 RS 423 RQV 250-1200 PA 435
Komb.-Nr. 0 401 846 448

supersedes 5.82
company Volvo
engine: TD 70 G
157 kW (213 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,8+0,1	10,2 - 10,4	0,4 (0,8)			2,5 ± 0,1
250	4,5-4,7	0,9 - 1,3	0,3 (0,6)			(2,2 - 2,9)

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever (3a) 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 10	100	min. 6,0	200	1,1-1,4
ca. 65	9,8	1240-1250					250	4,5-4,7	530	3,5-3,7
	4,0	1320-1350					380-440	= 2,0	870	5,2-5,3
	1400	0 - 1,0							1200	7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1240 - 1250*	LDA	0 bar	100	150,0-190,0	-	-
700	102,0-104,0		700	78,0 - 81,0		bei 20,0-21,0		
	(99,0-107,0)			(75,0 - 84,0)		mm RW		

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

H13

BOSCH
Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H13

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P..RS 423 + ..PA 435	0,7	0 0,35 0,26	10,8 - 10,9 9,5 - 9,6 10,4 - 10,5 9,8 - 10,0

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 UNI 9,6 a
4. Edition

En

PES6P110A720RS3105 RQV275-1150PA642

superseded 10.82
company: IVECO-UNIC
engine: 8220-22
176 kW (239 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2-3,3 (3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,7+0,1	12,2-12,4	0,4(0,8)			
275	5,3-5,5	0,9- 1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1190	15,2-17,8	-	-	-	ca. 11	100	min. 6,9	225	0,4-0,7
ca. 60	10,7	1190-1200					275	5,3-5,5	535	3,5-3,8
	4,0	1280-1310							840	5,2-5,5
	1400	0-1,0				280-375 (3a)			1150	8,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1150	0,7 bar 122,0-124,0 (119,0-127,0)	1190-1200 *	LDA 400	0 bar 87,0-89,0 (84,0-92,0)	100	160,0-180,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© By Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H15

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PES6P..RS3105 + .. PA 642	0,23	0,70 0 0,21	11,3-11,4 11,7-11,8 10,5-10,6 10,8-11,0

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 STE 12,0 b 1
1. Edition

En

PE 8 P 110 A 121 LS 3113 RQV 250-1100 PA 652
Komb.-Nr. 0 401 858 701
1 - 5 - 4 - 8 - 6 - 3 - 7 - 2 je 45° ± 0,5° (± 0,75°)

supersedes
company: Steyr
engine: WD 815.64
240 kW

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1101	12,0+0,1	15,8-16,0	0,4(0,75)			
250	1-6,3	1,5-2,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1140	15,2-17,8	-	-	-	ca. 12	100	min.7,7	200	0,7-0,9
							250	6,1-6,3	500	3,7-4,1
ca. 47	11,0	1140-1150							800	5,4-5,7
	4,0	1185-1215					325-385 = 2,0		1100	7,9
	1300	0-1,0								
						(3a)				

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,9 bar	1140-1150*	LDA	0,9 bar	100	240,0-280,0	1100	12,0+0,1
1100	158,0-160,0		500	159,0-163,0			310	12,0+0,3
	(155,0-163,0			(157,0-165,0)			640	12,2+0,2
			LDA	0 bar			500	12,4+0,1
			500	111,0-113,0				
				(108,0-116,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

H17

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 8 P..LS 3113 + RQV..PA 652	0,90		12,4 - 12,5
		0	9,7 - 9,8
		0,60	11,8 - 12,0
		0,48	10,8 - 11,0

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 8,0 i

3. Edition

En

PE 6 P 110 A 720 RS 3034 RQV 200-1200 PA 554

supersedes 8.81
company Scania
engine: DS 805

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,3-3,4 (3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,3+0,1	12,1-12,3	0,6(0,8)			2,5+0,1
225	5,3-5,3	1,5-1,9	0,2(0,4)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca.10	100	min.6,8	150	0,5-0,8
							225	5,3-5,5	500	3,8-4,5
ca. 61	11,3	1240-1250					320-380=2,0		850	5,9-6,1
	4,0	1380-1410							1200	8,4
	1500	0-1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 700	0,7 bar 121,0-123,0 (119,0-125,0)	1240-1250*	LDA 1200	0,7 bar 120,5-123,5 (118,0-126,0)	100	190,0-240,0 =20,0-21,0 mm RW	-	-
			LDA 500	0 bar 87,0-91,0 (85,0-93,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.33

H19

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H19

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P..RS 3034 +RQV.. PA 554	0,70	0 0,33 0,22	12,3-12,4 11,1-11,2 12,0-12,1 11,2-11,4

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1) and Governors

WPP 001/4 SCA 11,0 r6
1. Edition

En

PE 6 P 110 A 720 RS 3040 ROV 200-1000 PA 555-1

supersedes –
company: Scania
engine: DS 11

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,3-3,4 (3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,6+0,1	16,7-16,9	0,4 (0,8)			2,5 +0,1
225	4,4-4,6	1,6-2,0	0,3(0,5)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1050	15,2-17,8	-	-	-	ca.10	100	min. 5,9	150	0,5-0,8
									430	3,1-3,6
ca. 60	12,6	1040-1050					225	4,4-4,6	720	5,1-5,4
	4,0	1140-1170				250-355			1000	7,9
	1300	0 -1,0				(3a)				

Torque control travel a = – mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 700	0,7 bar 167,0-169,0 (164,0-172,0)	1040-1050*	LDA 1000	0,7 bar 169,0-175,0 (167,0-177,0)	100	220,0-270,0 =RW 20,0-21,0 mm	-	-
			LDA 500	0 bar 130,0-134,0 (127,0-137,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H21

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE 6 P.. RS 3040 + ROV.. PA 555-1	0,41		13,2-13,3
		0,70	13,6-13,7
		0	12,0-12,1
		0,26	12,3-12,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

H22

En H22

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 17,4a
2. Edition
En

Testoil-ISO 4113

PE 10 P 110 A 520/4 LS 846 RQV 250-1150 PA 562

supersedes
company MAN
engine: D 2540 MT
323 kW (439 PS)

1 - 8 - 7 - 6 - 3 - 5 - 2 - 10- 9 - 4
0 -27 -72 -99 -144-171-216-243-288-315 ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9+0,1	14,0 - 14,2	0,4(0,8)			
250	6,9-7,1	1,1- 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.12	100	min.8,6	200	0,6-0,8
							250	6,9-7,1	500	4,3-5,3
ca.64	10,9	1190-1200					400-460 = 2,0		850	6,6-6,7
	5,0	1335-1365							1150	8,4
	1450	0 - 1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1150	0,9 bar 140,0-142,0 (137,0-145,0)	1190 - 1200*	LDA 750	0,9 bar 134,0-138,0 (131,0-141,0)	100	145,0-175,0	-	-
			LDA 500	0 bar 115,0-118,0 (112,0-121,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

2.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

H23

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure
XXXXXXX

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
..LS 846 + ..PA 562	0,9		11,9 - 12,0
		0,38	11,7 - 11,8
		0,33	11,3 - 11,5
		0	11,1 - 11,2

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 00 1/4 MB 21,9a

3. Edition

En

Testoil-ISO 4113

PE 12 P 120 A 320 LS 3819 RQ 750 PA 635

supersedes 6.82

company: Daimler-Benz

engine: OM 424 A
330 kW (449 PS)
Generator

1- 5- 9- 8- 3- 4- 11- 10- 2- 6- 7- 12
0-15-60-75-120-135-180-195-240-255-300-315° ±0,5° (±0.75°)

Komb.-Nr. 0 401 840 705

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0-4,1 (3,95-4,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,9+0,1	19,3 - 19,5	0,5(0,8)			
300	4,8-5,0	1,4 - 2,0	0,8(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	10,9 4,0	750-755 780-790	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 750-755 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes mm 7
700	193,0 - 195,0 (190,0 - 198,0)		-	-	100	180,0 - 200,0

Checking values in brackets

Values apply to
engine nozzle-and-holder assemblies 1 683 901 019
and engine fuel-injection tubing 1 680 750 067

3.83

J1

J1

PE 12 P 120 A 320 LS 3819 RQ 900 PA 634

supersedes-

company: Daimler-Benz

engine: OM 424 A

374 kW

1 - 5 - 9 - 8 - 3 - 4 - 11- 10- 2 - 6 - 7 - 12

0 -15 -60 -75 -120-135-180-195-240-255-300-315° ± 0,5°(± 0,75°)

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Komb.-Nr. -
0 401 840 704

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	12,0+0,1	17,9-18,1	0,5 (0,9)			
300	4,8-5,0	1,2-2,0	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation				Idle speed regulation				Torque control ③	
		Setting point		Test specifications ④		Setting point		Test specifications ⑤			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	10,8 4,0 1050	900-905 935-945 max. 1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 900 - 905 min^{-1} 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
850	179,0-181,0 (176,0-184,0)	-	-	-	100	180,0-200,0

Checking values in brackets

3.83

J2

PE 10 P 120 A 520/5 LS 850 RQ 750 PA 404-2

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4

0-27-72-99-144-171-216-243-288-315° ±0,50 (±0,75°)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

supersedes

company MAN

engine D 2540 MLE
283 kW

Komb.-Nr.
0 401 849 164

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm from BDC Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,8+0,1	19,1-19,4	0,5(0,9)			
250	6,6-6,9	2,2-2,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ▭.

B. Governor Settings

Checking of slider PHG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	10,8 4,0 900	750-755 780-790 0-1,0	-	-	-	-	-	-

Torque-control travel - mm on flyweight assembly dimension a =

Speed regulation: At 750-755 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
700	191,0-194,0 (188,0-197,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

2.83

J3

J3

PES 6 P 120 A 720 LS 457 RQ 750 PA 566

supersedes

company MAN

engine D 2566 MLE 198 kW

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 6 = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,5+0,1	20,2-20,4	0,5(0,8)			
250	6,1-6,3	1,5-2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point ④		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	11,5 4,0 900	750-755 775-785 0-1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 750-755 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
700	202,0-204,0 (199,0-207,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

J4

2.83

J4

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BET 8,8 a
2. Edition
En

PE 6 P 120 A 320 RS 383 RQV 250-1200 PA 425 R

supersedes 2.82
company: RVI
engine: MIDS 062030
165,5 kW (225 PS)
Komb.-Nr.
0 401 846 404

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	13,9+0,1	14,8 - 15,1	0,5(0,9)			
275	4,7-4,9	0,8 - 1,4	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1240	15,2-17,8	-	-	-	ca. 12 ③a	100	min.6,3	200	0,2-0,6
							275	4,7-4,9	530	2,9-3,1
ca. 66	12,9	1245-1255							870	4,8-5,0
	4,0	1340-1370							1200	8,0
	1500	0 - 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm 9
LDA 1200	0,7 bar 148,0-151,0 (145,0-154,0)	1245-1255*	LDA 700	0,7 bar 144,0-148,0 (141,0-151,0)	100	120,0-140,0 = RW 19,5 - 21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

J5

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

J5

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 . rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P..RS 383 + RQV..PA 425 R	0,23	0,70 0 0,19	13,4 - 13,5 13,9 - 14,0 12,2 - 12,3 12,6 - 12,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 RVI 8,8 d 1
1. Edition

PES 6 P 120 A 320 RS 419 RQV 275-1100 PA 495

supersedes

company: RVI
engine: MIDR 062045
206 kW (280 PS)

Komb.-Nr.
0 402 046 249

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 - 2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,3+0,1	17,7 - 18,1	0,4(0,8)			
275	3,4-3,6	0,5 - 1,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 8	100	min.5,0	250	1,0-1,2
							275	3,4-3,6	530	4,0-4,6
ca.64	9,3	1155-1165							820	5,9-6,1
	4,0	1220-1250				280-395			1100	8,1
	1350	0 - 1,0								
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1100	0,7 bar 177,0-181,0 (174,0-184,0)	1155-1165*	LDA 700	0,7 bar 163,0-196,0 (160,0-172,0)	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz.-Ausrüstung
© by Robert Bosch GmbH D-7 Stuttgart 1, Postfach 30 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J7

D. Adjustment Test for Manifold Pressure Compensator

RVI 8,8 d 1

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 P..RS 419 + RQV..PA 495	0,25	0,70 0 0,20	9,7 - 9,8 10,3 - 10,4 8,3 - 8,5 8,8 - 9,0

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

J8

En J8

Test Specifications Fuel Injection Pumps and Governors

(1) WPP 001/4 MB 14,6 o

2. Edition En

PE 8 P 120 A 320 LS 3816 RQV 350-1150 PA 590
1 - 8 - 7 - 2 - 6 - 3 - 54 je 45° ± 0,5° (± 0,75°)
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

superseded 9.82
company Daimler Benz
engine: OM 422 A
243 kW (330 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,0+0,1	15,8-16,0	0,5(0,9)			
350	4,9-5,1	1,2-1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 10	100	min.6,0	300	0,6-0,9
							350	4,5-4,6	580	3,6-3,8
ca. 63	10,0	1190-1200							870	5,2-5,4
	4,0	1270-1300							1150	7,6
	1400	0 - 1,0				370-480 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2) rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel (5) rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1190-1200*	LDA	0,7 bar	100	140,0-160,0	1050	11,0+0,1
1150	158,0-160,0		600	166,0-172,0			850	11,4+0,1
	(155,0-163,0)			(163,0-175,0)			750	11,5+0,2
			LDA	0 bar				
			500	140,0-142,0				
				(137,0-145,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

J9

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J9

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 8 P..LS 3816 + ..PA 590	0,47	0,70 0 0,40	11,4-11,5 11,6-11,7 10,5-10,6 10,9-11,0

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 VOL 12,0 d 1
3. Edition
En

PE 6 P 120 A 320 RS 3050 ROV 250-1100 PA 611

supersedes: 82
company: Volvo
engine: TD 120 F

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,4-2,5 (2,35-2,55) mm (from BDC) - RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,1+0,1	24,2-24,5	0,5(0,9)			2,5 ±0,1
250	3,8-4,0	2,2-2,6	0,5(0,7)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1180	15,2-17,8	-	-	-	ca. 7	100	min. 5,3	200	0,7-0,9
ca. 65	12,1	1160-1170					250	3,8-4,0	500	4,2-4,8
	4,0	1225-1255					290-350	=2,0	660-1040	5,4-6,6
	1350	0 - 1,0				(3a)			1100	7,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	1,2 bar	1160-1170*	LDA	0 bar	100	20.0-21,0	-	-
700	241,5-244,5		700	142,5-146,5		mm RW		
	(238,5-247,5)			(139,5-149,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© By Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J11

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
PE 6 P ..RS 3050 + RQV.. PA 611	0,67	1,2 0 0,30	12,2-12,3 13,1-13,2 9,2- 9,3 10,5-10,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MAN 17,4 b 1

1. Edition

En

PE 10 P 120 A 520/4 LS 850 RQV 250-1150 PA 647

1- 8- 7- 6 - 3 - 5 - 2 - 10- 9- 4

0-27-72-99 -144-171-216-243-288-315° ±0,5° (±0,75°)

supersedes

company MAN

engine: D 2540 MLE
405 kW

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,2+0,1	18,5-18,8	0,4(0,9)			
250	6,2-6,4	1,2-1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 12 (3a)	100	min. 7,8	200	0,6-0,8
							250	6,2-6,4	520	4,9-5,2
ca. 63	10,2	1190-1200							830	6,1-6,4
	4,0	1255-1285					410-470=2,0		1150	7,5
	1400	0-1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1150	1,0 bar 185,0-188,0 (182,0-191,0)	1190-1200*	LDA 500	0 bar 119,0-122,0 (116,0-125,0)	100	205,0-225,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J13

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE 10 P..LS 850 +RQV.. PA 647	1,0	0 0,65 0,54	11,2-11,3 9,6-9,7 10,8-10,9 10,0-10,3

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BRE 30,8 a

1. Edition

En

PE 8 P 130 A 520/6 LS 450 RQV 300-900 PA 500

1-2-6-3-4-5-7-8 je 45° ±0,5°(±0,75°)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

supersedes

company Breda

engine: ID 36 N 8 V

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr.

0 401 838 020

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	9,2-9,3	16,5-16,8	0,5(0,9)			
300	6,8-7,0	2,2-2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	990	15,2-17,8	-	-	-	ca.16	100	min.8,4	250	1,0-1,3
							300	6,8-7,0	470	3,8-4,4
ca. 57	8,2	940-950							680	5,6-5,8
	4,0	1000-1030							900	7,6
	1150	0-1,0				300-395 (3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
900	165,0-168,0 (162,0-171,0)	940-950*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps and Governors ①

WPP 001/4 BRE 9,6 e
1. Edition

En

PE 6 P 120 A 320 RS 461 RQV 300-1500 PA 500

supersedes
company: Breda
engine: ID 32
243 kW

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Komb.-Nr.
0 401 846 478

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1500	10,0+0,1	14,5-14,9	0,5(0,9)			
300	7,1-7,3	1,5-2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1500	15,2-17,8	-	-	-	ca.14	100 300	min.8,7 7,1-7,3	250 670 1080 1500	1,0-1,2 3,8-4,0 5,9-6,1 8,8
ca. 62	9,0 4,0 1750	1540-1550 1625-1655 0 - 1,0				335-450 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1500	145,0-149,0 (142,0-152,0)	1540-1550*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

J16

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 BE 9,7 a

1. Edition

En

PE 6 P 120 A 320 RS 460 RQV 300-1500 PA 500

1- 2- 3 - 4 - 5 - 6
0-45-120-165-240-285 ° ± 0,5 ° (± 0,75 °)

supersedes
company: Breda
engine: ID 38
367,5 kW

Komb.-Nr.
0 401 846 477

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1500	10,0+0,1	14,6-14,9	0,5(0,9)			
300	7,8-8,0	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1500	15,2-17,8	-	-	-	ca.18	100 300	min.9,4 7,8-8,0	250 670 1080 1500	1,6-1,8 4,0-4,2 6,2-6,4 9,1
ca.63	9,0 4,0 1750	1540-1550 1625-1655 0 - 1,0				335-440 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1500	146,0-149,0 (143,0-152,0)	1540-1550*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

2.83

BOSCH
Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J17

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BRE 23,1 a
1. Edition
En

PE 6 P 130 A 320/3 LS 449 RQV 300-900 PA 500

supersedes

1 - 6 - 5 - 4 - 3 - 2
0 -75 -120-195-240-315° ± 0,5° (± 0,75°)
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

company: Breda
engine: ID 36 N 6 V
225 kW

Komb.-Nr.
0 401 836 022

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5 - 3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	9,2-9,3	16,5-16,8	0,5 (0,9)			
300	6,8-7,0	2,2-2,8	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	990	15,2-17,8	-	-	-	ca. 16	100	min. 8,4	250	1,0-1,3
ca. 57	8,2	940-950					300	6,8 - 7,0	470	3,8-4,4
	4,0	1000-1030							680	5,6-5,8
	1150	0-1,0				300-395			900	7,6
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b): rev/min (4a) 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
900	165,0-168,0 (162,0-171,0)	940-950*	-	-	100	19,5-21,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

J18

Test Specifications Fuel Injection Pumps and Governors

(1) WPP 001/4 MAN 17,4 b 2

1. Edition

En

PE 10 P 120 A 520/4 LS 850 RQV 250-1150 PA 645

supersedes

company MAN

engine D 2540 MLE
405 kW (551 PS)
0 401 849 165

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4
0-27-72-99-144-171-216-243-288-315° ±0,5° (± 0,75°)
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,2+0,1	18,6-18,9	0,5(0,8)			
250	6,1-6,3	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 11	100	min. 7,7	200	0,6-0,8
Ca. 63	10,2	1190-1200					250	6,1-6,3	520	4,8-4,9
	4,0	1255-1285					380-440	= 2,0	830	5,9-6,2
	1400	0 - 1,0							1150	7,9
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1150	186,0-189,0 (183,0-192,0)	1190-1200 *	-	-	100	270,0-290,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J19

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 12,8 n 2
1. Edition

En

PE 8 P 100 A 320 LS 819 RQV 350-1250 PA 378 R

supersedes

Komb.-Nr. 0 401 848 073

company Daimler-Benz
engine: OM 402
188 kW (256 PS)

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45 ° ± 0,5 ° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4-3,5 (3,35-3,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,3+0,1	10,0-10,2	0,3(0,6)			
350	7,5-7,7	2,0- 2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca. 18	100 350	min. 9,2 7,5-7,7	300 620 930 1250	0,9-1,1 3,6-3,9 5,3-5,6 8,3
ca. 65	9,3 4,0 1500	1280-1290 1360-1390 0 - 1,0				400-600 (3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1230	100,0-102,0 (98,0-104,0)	1280-1290 *	1230 **	73,0-75,0 (71,0-77,0)	100	110,0-130,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Adjusted at the inner lever of the reduced-delivery stop. 2.83

BOSCH
Geschäftsbereich KH. Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

J20

J20

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4MB 12,8 n 1
1. Edition

En

PE 8 P 100 A 320 LS 819- 1 RQV 350-1250 PA 378-2

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45 ° ± 0,5 ° (± 0,75 °)

supersedes
company: Daimler-Benz
engine: OM 402
188 kW (256 PS)
Komb.-Nr.
0 401 848 081

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4-3,5 (3,45-3,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,3+0,1	10,0-10,2	0,3(0,6)			
350	7,5-7,7	2,1-2,5	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca.18	100	min. 9,2	300	0,9-1,1
							350	7,5-7,7	620	3,6-3,8
ca. 65	9,3	1280-1290							930	5,3-5,6
	4,0	1360-1390							1250	8,3
	1500	0 - 1,0				400-600 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1230	100,0-102,0 (98,0-104,0)	1280-1290 *	1230	73,0-75,0 (71,0-77,0) **	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Adjusted at the inner lever of the reduced-delivery stop.

2.83

J21

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 11,0 r
4. Edition
En

PE 6 P 110 A 720 RS 3040, I...Z RQV 250-1100 PA 379 R

PE 6 P 110 A 720 RS 3041, I...Z EP/RSV 350-1100 P 1/310 R

superseded 1.80
company: Scania
engine: DS 11
206 kW (280 PS)

Variations in output -sida 3!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,30-3,40 (3,25-3,45) mm (from BDC) RW 10,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 3040 + RQV cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery 3041 + RSV cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,0+0,1	15,5 - 15,7	0,4(0,8)	13,0	15,7 - 15,9	3,3 ± 0,1 **
600	13,0+0,1	15,5 - 16,0		13,0	16,1 - 16,5	(max. 0-3,5)
225	4,0-4,2	0,7 - 1,1	0,2(0,4)	350 3,7-3,9	0,7 - 1,1	

Adjust the fuel delivery from each outlet according to the values in [ ].

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly

B. Governor Settings

RQV ... 379 R

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100 1400	15,2 - 17,8 0 - 1,0	-	-	-	ca. 10	100 225 310-370	5,5 4,0-4,2 = 2,0	200 500 800 1100	1,0-1,2 3,8-4,1 5,4-5,6 8,0
ca. 61	12,0 4,0	1140-1150 1250-1280				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1100	0,7 bar 155,0-157,0 (153,0-159,0)	1140-1150*	LDA 600	0,7 bar 156,5-159,5 (154,0-162,0)	100 225	240-290 0- 13 Dispersionmax. 2 (4)**	-	-
			LDA 500	0 bar 128,0-132,0 (126,0-134,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

J22

EP/RSV ... 310 R

B. Governor Settings

① Upper rated speed rev/min: Degree of deflection of control lever (1)	Control rod travel mm (2)	Control rod travel mm rev/min (3)	Intermediate rated speed (4) (5) (6)	④ Lower rated speed: Control-lever deflection in degrees (7)	rev/min (8)	Control rod travel mm (9)	③ Torque control: rev/min (10)	Control rod travel mm (11)
ca. 66	1100 16,0 1150 11,7 1200 6,0		without auxiliary spring	ca. 30	350	6,0		max.
② 2a	1140-1150 = 12 1220-1255 = 4,0 1290 0,3 - 1,7		with auxiliary spring		100 350 400 550	min. 19 5,7-6,3 3,2-4,7 0-1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop, Test oil temp. 40°C (104°F): rev/min (1)	cm³/1000 strokes (2)	⑥ Rotational-speed limitat. Note: changed to ...) rev/min (3)	③a Fuel delivery characteristics: rev/min (4)	cm³/1000 strokes (5)	Starting fuel delivery ⑤ Idle: rev/min (6)	cm³/1000 strokes (7)	④a Idle stop: rev/min (8)	Control rod travel mm (9)
1100	155,0 - 157,0 (152,0 - 160,0)	1140-1150*	600	161,0 - 165,0 (158,0 - 168,0)	100 350	20,5-21,0 9-13 Dispersion max. 2 (4) 5,0 -5,5 mm RW** Dispersion max. 4 (7)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting: Gauge pressure = bar	Measurement: Gauge pressure = bar	Control rod travel-difference mm (1)
PE 6 P .. RS 3040 + RQV .. PA 379 R	0,38	0,70 0 0,28	12,8 - 12,9 13,0 - 13,1 11,7 - 11,8 12,1 - 12,3

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

En

J23

J23

Increased or reduced outputs of the types listed on page 1-2:

Output variation	Output %	Fuel delivery in cm^3/1000 strokes at pump speed (min^{-1}) 1)				Adjustment of control-rod position from 100% setting (mm)
		1100	900	750	600	
P	120	205	208	212	214	+ 2,6
U	115	191	196	198	200	+ 1,9
R	113	186	191	192	195	+ 1,7
W	110	180	185	185	188	+ 1,3
V	108	175	179	179	183	+ 1,0
Y	105	170	173	172	177	+ 0,7
T	103	166	167	166	171	+ 0,4
S	98	154	156	156	158	- 0,2
X	95	146	149	149	150	- 0,5
Q	93	141	145	145	146	- 0,8
Z	90	134	138	139	140	- 1,1
O	88	131	134	136	137	- 1,3
N	85	124	126	130	131	- 1,6
M	80	114	115	119	121	- 2,1
L	75	105	106	108	111	- 2,6
K	70	98	98	98	99	- 3,0
J	65	89	90	90	90	- 3,4
I	60	86	84	83	80	- 3,8

1) Tolerances with fuel quantity are ± 1 cm^3 at setting speed.

With subsequent orders from KH/ALP only the standard setting according to page 1-2 will be delivered. If required, the above mentioned variations are to be carried out through your local BOSCH Service Station.

The delivery amounts given in the table have been compiled from Saab-Scania documentation upon their request.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 ALO 13,8 a
1. Edition

En

PES 6 P 120 A 320 RS 410 RQV 400-1050 PA 496 K
Komb.-Nr. 0 402 046 201

supersedes -
company: Allis Chalmers
engine: 613.8 I
355 PS

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,7+0,1	23,3-23,5	0,4			
400	6,0-6,2	2,5- 3,1	0,4			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever (3a) 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
ca.61	1050	15,2-17,8	-	-	-	ca.17,5	100	min.7,5	-	-
ca.59	10,7	1090-1100					400	5,5-5,7		
	4,0	1205-1235					465-525	=2,0		
	1270	0 - 1,7					600	max.1,0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
1050	233,0-235,0	1090-1100*	800	212,0-216,0	100	140,0-180,0	1050	11,7
							800	11,2+0,3

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

KA

Test Specifications Fuel Injection Pumps and Governors

WWP 001/4 VOL 7,0 a 2
1. Edition

En

PE 6 P 100/320 RS 169 (A)
RQV 200-1200 PA 122/2 R
RQV 250-1200 PA 235/2 R

supersedes
company: Volvo
engine: TD 70

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8-2,9 (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	10,4-11,1	0,5			2,5-0,1 (max. 2,2-2,9)
600	9,0	3,3-4,3				
600	12,0	9,8-11,2				
600	15,0	14,9-16,5				
200	9,0	2,3-3,3				

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings .. PA 122/2 R

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1) rev/min 10	mm 11
ca. 68	1290	15,0-18,0	-	-	-	ca. 23	200	8,6-10,0	1290	8,3
	1550	0					300	6,4-8,8		
ca. 66	1200	15,0-17,8					400	2,9-5,4		
	1300	7,7-12,6					500	0,7-2,7		
	1400	0 - 7,6					590	0		
	1500	0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2) rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a) rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b) rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6) rev/min 6	cm³/1000 strokes 7	Torque-control travel (5) rev/min 8	Control rod travel mm 9
LDA 700	0,7 bar 82,0-84,0 (81,0-85,0)	1230-1240*	LDA 700	0 bar 63,5-65,5 (62,5-66,5)	100 200	150,0-180,0 11,0-15,0	-	-
					Dispersion max. 2,5			

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.83

K2

K2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min (1a) (2a)	Degree of deflection of control lever	rev/min	Control rod travel mm (4)	Degree of deflection of control lever	rev/min	Control rod travel mm (3)	rev/min (1)	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1290 1560	15,0-18,4 0	-	-	-	ca. 13 (3a)	100 200 300 380 510	8,9-11,0 7,0-10,0 3,8-6,8 0 -4,0 0	1290	8,3
ca. 45	1200 1300 1400 1510	15,0-18,2 8,1-13,2 0 - 7,4 0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 700	0,7 bar 82,0-84,0 (81,0-85,0)	1230-1240*	LDA 700	0 bar 59,5-62,5 (58,5-63,5)	100 200	15,0-180,0 11,0-15,0 Dispersion max. 2,5	-	

Checking values in brackets

* 1 mm less control rod travel than col 2

TestoilISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm
PE 6 P .. RS 169 + RQV .. PA 122/2R bzw. + RQV.. PA 235/2 R	0,21-0,24	0,07-0,11	

En

K3

K3

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 7,0 i
3. Edition

En

PE6P110A320RS413 Y RQV 250-1200 PA 499

Komb.-Nr. 0 401 846 439

supersedes 12.82
company: Volvo
engine: TD 70 F
180 kW (245 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1 (2,95-3,15) mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,4+0,1	12,9-13,1	0,4(0,8)			2,5 ±0,1
250	4,9-5,1	1,6- 2,0	0,3(0,6)			(max. 2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3 (1a) (2a)	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6 (4)	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9 (3)	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 9	100	min.6,4	200	0,6-0,8
							250	4,2-5,1	530	3,1-3,5
ca.62	11,4	1240-1250							870	5,6-5,9
	4,0	1370-1400							1200	7,9
	1500	0 - 1,0				300-410 (3a)				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1240-1250*	LDA	0 bar	100	160,0-200,0	-	-
700	129,0-131,0		700	78,0-81,0		= RW 20,0-		
	(126,0-134,0)			(75,0-84,0)		21,0 mm		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

K4

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

K4

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

VOL 7,0 i

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
413 Y + 499	0,7	0,51 0,30 0	12,4 - 12,5 12,0 - 12,1 10,7 - 10,9 9,8 - 9,9

Notes

(1) when n = rev/mn and gauge pressure = bar (= maximum full-load control rod travel)

K5

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 n
1. Edition
En

PE 12 A 95 D 610 LS 2453 RQV 750 AB 996 L
1 - 4 - 9 - 8 - 5 - 2 - 11- 10- 3 - 6 - 7 - 12
0 - 15- 60- 75-120-135-180-195-240-255-300-315° ± 0,5°
(± 0,75°)

supersedes_
company: KHD
engine: F 12 L 413 F
Komb.-Nr. 0 400 640 094

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 - 2,1 (1,95-2,15) mm (from 3DC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
710	9,5-9,6	8,0 - 8,2	0,3(0,6)			
300	5,6-5,7	0,4 - 0,9	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
ca. 27	9,0 4,0	750-755 770-785	-	-	-	- ③a	-	-	-	-

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed ②b ④a rev/min 3	Fuel delivery characteristics high idle speed ⑤a ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm 9
710	79,5-81,5 (77,5-83,5)	750-755*	-	-	100	120,0-130,0 = 13,8-14,5 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

0,5 3.83

K6

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

K6

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 m
1. Edition
En

PE 12 A 95 D 610 LS 2453 RQV 300-900 AB 1090 L
Komb.-Nr. 0 400 640 108

supersedes -
company: KHD
engine: F 12 L 413 FW
177 kW (240 PS)
1800 min⁻¹

1- 4- 9- 8- 5 - 2 - 11- 10- 3 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ± 0,5° (± 0,75°)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0-2,1 (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	8,9-9,0	7,2 - 7,4	0,35(0,6)			
300	5,9-6,1	1,4 - 2,0	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	900	15,2-17,8	-	-	-	ca. 24	100	min.7,5	250	0,5-0,7
							300	5,9-6,1	470	4,0-5,2
ca. 59	7,9	940- 950					340-400 = 2,0		680	6,2-6,5
	4,0	990-1020							900	8,2
	1100	0 - 1,0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed ②b limitation intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
900	71,5-73,5 (69,5-75,5)	940-950*	750	80,5-83,5 (78,0-86,0)	100	19,0-21,0 mm RW	900	8,9+0,1
							400	9,6+0,1
			850	72,5-75,5 (70,0-78,0)			750	9,2+0,2
							850	9,0+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

K7

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

K7

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 11,0 m
2. Edition
En

Testoil-ISO 4113

PE 6 P 110 A 320 LS 3814 RQV 350-1150 PA 378

6 - 3 - 5 - 2 - 4 - 1
0 -45 -120-165-240-285 °±0,5° (±0,75°)

superseded 5.81
company Daimler Benz
engine OM 421
159 kW (216 PS)

Komb.-Nr. 0 401 846 741

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,95-4,15) 4,00-4,10 mm (from BDC) RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	12,7+0,1	13,5-13,7	0,4(0,8)			
350	8,2-8,4	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1130	15,2-17,8				ca. 14	100 350	min.8,5 7,0-7,2	300 670 1500	1,1 3,9-4,1 8,4
ca. 66	12,0 4,0 1400	1170-1180 128 -1310 0 - 1,0				375-485 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
1130	135,0-137,0 (132,5-139,5)	1170-1180*			100	130,0-150,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 8,0 i 1
1. Edition
En

PE 6 P 110 A 720 RS 3034 Z RQV 200-1200 PA 554
Komb.-Nr. 0 401 846 770

supersedes_
company: Saab Scania
engine: DS8 05

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,3 - 3,4 (3,25-3,45) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,8+0,1	10,1 - 10,3	0,4(0,8)			2,5 ± 0,1
225	5,3-5,5	1,5 - 1,9	0,3(0,5)			(2,2 - 2,9)

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1220	15,2-17,8	-	-	-	ca. 16	100	min.7,4	150	0 -1,0
ca. 61	10,8	1240-1250					225	5,9-6,1	500	3,4-3,9
	4,0	1360-1390							850	5,4-5,8
	1500	0 - 1,0					410-470 = 2,0		1200	7,9
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA 700	0,9 bar 101,0-103,0 (99,0-105,0)	1240-1250*	LDA 1200	0,9 bar 111,5-114,5 (109,5-117,0)	100	190,0-240,0 = 20,0-21,0 mm RW	-	-
			LDA 500	0 bar 85,0-89,0 (83,0-91,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

K9

D. Adjustment Test for Manifold Pressure Compensator

SCA 8,0 i 1

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P..RS 3034 Z + RQV..PA 554	0,90	0 0,21	11,8 - 11,9 10,9 - 11,0 11,7 - 11,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

K10

En K10

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VOL 3,6k
1. Edition

En

VE 4/10 F 1900 L 109

0 460 404 029

supersedes
company: Volvo-Penta
engine: 8199
70 PS-B-Leistung

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting 0,2 mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	4,4-4,8	mm		
1.2 Supply pump pressure	1500	6,9-7,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	43,0-44,0	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	300	20,5-24,5	cm³/1000 strokes		3,0
1.5 Start	100	min. 60,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2100	24,5-30,5	cm³/1000 strokes		
1.7 Load-dependent start of delivery					

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	1900
	mm	1,8-2,6 (1,5-2,9)	(3,9 - 5,3)	5,1-5,9 (4,8-6,2)
2.2 Supply pump	n = rev/min	600		1900
	bar (kgf/cm²)	3,7 - 4,3		8,3 - 8,9
Overflow delivery	n = rev/min	600		1900
	cm³/10 s	55 - 138 (40 - 153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2350	max. 4,0	
	2300	1,0-9,0 (1,0-9,0)	
	2100	(23.5-31,5)	
	1900	40,0-43,0 (39,2-43,8)	
	1500	(41,2-45,8)	
	800	45,0-48,0 (44,2-48,8)	
	600	39,5-43,5 (38,5-44,5)	
switch-off	1900	0	
Idle stop	300	(18,5-26,5)	
	400	0,5-6,5	
	450	max. 2,5	
End stop	350	min. 5 0	
	450	max. 48	

2.4 Solenoid — max. cut-in voltage / test voltage

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,7-6,0
MS	1,4-1,6
SVS	max. 4,2
A	
B	

Observations

K11

KAA

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,4 g
1. Edition

En

VE 6/10 F 2000 L 115
0 460 406 015

supersedes
company: VWW
engine: 50 Hz. Aggr.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Testoil-ISO 4113

Pre-stroke setting mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1200	2,2 - 2,6	mm		
1.2 Supply pump pressure	1200	4,4 - 5,0	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1200	30,5 -31,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	350	6,0 -10,0	cm³/1000 strokes		2,5 (3,0)
1.5 Start	100	min. 35,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2070	8,0 -14,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	900	1200	1950
	mm	1,3-2,1 (1,0-2,4)	(1,7-3,1)	4,2-5,0 (3,9-5,3)
2.2 Supply pump	n = rev/min	600		1950
	bar (kgf/cm²)	2,8-3,4		6,4-7,0
Overflow delivery	n = rev/min	600		1950
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2150	max. 1,5		
	2070		(7,0-15,0)	
	2050	13,0-19,0	(12,0-20,0)	
	1950	22,5-24,9	(21,4-26,0)	
	1200		(28,7-33,3)	
	600	23,0-26,0	(21,5-27,5)	
switch-off elect.	400	0		
Idle stop	430	max. 1,5		
	350		(4,0-12,0)	
End stop	350	min. 30		
	450	max. 30		

2.4 Solenoid	max. cut-in voltage	xxx min. 10 V rated voltage 12V.

3. Dimensions

for assembly and adjustment mm

Designation	mm
K	3,2-3,4
KF	6,3-6,6
MS	1,4-1,6
SVS	2,7
A	
B	

Observations

3.83

K12

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,4 g1

1. Edition

En

VE 6/10 F 1800 L 115-1

0 460 406 016

supersedes –

company: VWW

engine: 50 Hz. Aggr.

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting – mm

1. Settings

	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1200	2,3- 2,7	mm		
1.2 Supply pump pressure	1200	4,4- 5,0	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1200	30,5-31,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	–	–	cm³/1000 strokes		
1.4 Idle speed regulation	350	5,0-11,0	cm³/1000 strokes		2,5 (3,0)
1.5 Start	100	min. 35,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1830	17,0-23,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	–	–			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	900	1200	1750
	mm	~~1,1-1,9 (0,8-2,2)~~	~~(1,8-3,2)~~	~~4,0-4,8 (3,7-5,1)~~
2.2 Supply pump	n = rev/min	600		1750
	bar (kgf/cm²)	2,7-3,3		5,8-6,4
Overflow delivery	n = rev/min	600		1750
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1950	max. 1,5		
	1880	min. 5,0		
	1890		(16,0-24,0)	
	1750	25,3-27,7	(24,2-28,8)	
	1200		(28,7-33,3)	
	600	23,0-26,0	(21,5-27,5)	
switch-off elect.	400	0		
Idle stop	430	max. 1,5		
	350		(4,0-12,0)	
End stop	350	min. 30		
	450	max. 30		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V; xxxx rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	6,3-6,6
MS	1,4-1,6
SVS	2,7
A	
B	

Observations

K13

K13

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 14,6 h 3
1. Edition

En

PE 8 P 120 A 320 LS 3807 RQ 750 PA 374 R

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45° ± 0,5° (± 0,75°)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes -
company: Daimler-Benz
engine: OM 422 A
196 kW (266 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC) Zyl. 8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,5±0,1	17,8 - 18,0	0,5 (0,9)			
300	5,0-5,2	1,2 - 1,8	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① rev/min 1	Control rod travel mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
-	-	-	-	10,5 4,0	750-755 785-795	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
700	178,0-180,0 (175,0-183,0)	-	-	-	100	200,0-210,0

Checking values in brackets

10.82

K14

K14

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 VOL 12,0 f 3

1. Edition

En

PE 6 P 120 A 320 RS 3071 Y RQV 250-1025 PA 371

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes

company: Volvo

engine: TD 120 G
213 kW (290 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6-2,7 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,2+0,1	17,5-17,8	0,6(0,9)			
250	5,7-5,9	2,2-2,6	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.12	100	min.7,2	200	0,7-0,9
							250	6,7-5,9	475	2,7-3,0
ca. 42	9,2	1065-1075					340-390=2,0		750	4,7-5,0
	4,0	1145-1175							1025	6,9
	1300	0-1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
LDA 700	0,75 bar 175,0-178,0 (172,0-181,0)	1065-1075*	LDA 700	0 bar 155,0-159,0 (152,0-162,0)	100	240,0-280,0 =RW 20,0-21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

K15

K15

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 6 P..RS 3071 Y +RQV..PA 371	0,29	0,75 0 0,24	9,9-10,0 10,2-10,3 9,2-9,3 9,5-9,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 9,8 b 1

En 1. Edition

PE 6 P 120 A 321 RS 438 RQV 275-1200 PA 648

supersedes.
company: RVI
engine: MID 062045

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	11,2+0,1	13,4-13,7	0,5(0,9)			
275	5,3-5,5	0,7-1,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1230	15,2-17,8	-	-	-	ca. 11	100 275	min.6,9 5,3-5,5	250 570 880 1200	0-0,9 4,7-5,0 6,1-6,3 8,3
ca. 65	10,2 4,0 1500	1240-1250 1335-1365 0-1,0				270-365 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1200	134,0-137,0 (131,0-140,0)	1240-1250*	-	-	100	180,0-200,0	-	-
					275	7,0-13,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

K17

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 GUS 21,2 a
2. Edition
En

Testoil-ISO 4113

PE 8 P 130 A 520/4 RS 3085 RQV 350-900 PA 602

superseded 8.81
company Guascor
engine E 212

1 - 2 - 4 - 5 - 6 - 3 - 7 - 8 je $45^{0} \pm 0{,}5^{0}$ ($\pm 0{,}75^{0}$)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3 (3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	8,5-8,6	18,8 - 19,1	0,5(0,9)			
350	4,0-4,2	2,2 - 2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	950 1100	15,2-17,8 0 - 1	-	-	-	ca.10	100 350	min.5,6 4,0-4,2	300 500 700 900	1,0-1,2 2,8-3,2 4,7-5,1 7,8
ca.58	7,5 4,0	940 - 950 965 -995				355-455 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) Idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control (5) travel: rev/min 8	Control rod travel mm 9
900	188,0-191,0 (185,0-194,0)	940 - 950*	-	-	100	19,5 - 21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

K19

PE 8 P 120 A 320 LS 3807 RQ 300/1150 PA 511

supersedes 3.82
company: Damiler-Benz
engine: OM 422 LA
276 kW(375 PS)

1-8-7-2-6-3-5-4 je 45° ±0,5° (±0,75°)
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0-4,1 (3,95-4,15) mm (from BDC) Zyl. 8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,6+0,1	18,9-19,1	0,5(0,9)			
300	4,8-5,0	1,2-2,0	0,8(1,2)			
1150/600	11,6+0,1	C, Sp.2 u. 5	0,75(1,2)			
500	10,1+0,1	C, Sp. 5	0,75			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel rev/min 1	mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
600	19,1-20,8	600	20,0	10,7	1190-1205	300	4,3	100	min.6,0	-	-
VH =	max. 46°			4,0	1250-1280			300	4,2-4,4		
				1350	0 - 1,0			335	375=2,0		

Torque-control travel on flyweight assembly dimension a = - mm

Speed regulation: At 1190-1205 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel mm cm³/1000 strokes 7
LDA 900	0,7 bar 189,0-191,0 (186,0-194,0)	-	LDA 600	0,7 bar 182,0-186,0 (179,0-189,0)	100	140,0-160,0
LDA 1150	0,7 bar 185,0-189,0 (182,0-192,0)		LDA 500	0 bar 139,0-141,0 (136,0-144,0)		

Checking values in brackets

2.83

K19

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

MB 14,6 i

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 8 P .. LS 3807	0,44		11,1-11,3
+ RQ .. PA 511		0,70	11,6-11,7
		0	10,1-10,2
		0,34	10,5-10,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 21,9 d
1. Edition

En

PE 12 P 120 A 320 LS 3819-2 RQ 300/1050 PA 656

supersedes–

company: Daimler-Benz
engine: OM 424 LA
441 kW
Komb.-Nr. 0 401 840 713

1 - 5 - 9 - 8 - 3 - 4 - 11- 10- 2 - 6 - 7 - 12
0 -15 -60 -75 -120-135-180-195-240-255-300-315° ±0,5° (±0,75°)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,8+0,1	19,2-19,4	0,5(0,9)			
300	5,0-5,2	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check (1)		Full-load speed regulation Setting point		Test specifications (4)		Idle speed regulation Setting point		Test specifications (5)		Torque control (3)	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	19,1-20,8	600	20,0	10,8 4,0 1300	1095-1110 1165-1195 0-1,0	300	4,6	100 300 340-380	min.6,0 4,5-4,7 = 2,0	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1095-1110 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery Idle speed (6)	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel mm / cm³/1000 strokes 7
LDA 1050	0,6 bar 192,0-194,0 (189,0-197,0)	-	LDA 500	0 bar 141,0-143,0 (138,0-146,0)	100	170,0-190,0 (166,0-194,0)

Checking values in brackets

3.83

K21

D. Adjustment Test for Manifold Pressure Compensator

MB 21,9 d

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE12P..LS3819-2 + RQ...PA656	0,60		11,8 - 11,9
		0	10,8 - 10,9
		0,43	11,4 - 11,5
		0,38	11,1 - 11,3

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 FIA 13,8 a 2

2. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167 R0225/1100 PA 336 R

supersedes 10.80

company: Fiat

engine: 8210.12.275
154,5 kW (210 PS)

Komb.-Nr. 0 401 846 429

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) 2,00-2,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,3+0,1	16,3 - 16,6	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check (1)		Full-load speed regulation Setting point		Test specifications (4)		Idle speed regulation Setting point		Test specifications (5)		Torque control (3)	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
550	15,6-16,4	550	16,0	9,3	1145-1160	225	5,3	100	min.6,8	1100	10,3-10,5
								225	5,2-5,4	550	10,3-10,5
1300	0 - 1			4,0	1190-1220			315-355	=2,0		

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever (2) Test oil temp. 40°C (104°F)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery Idle speed (6)	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1100	163,0 - 166,0 (160,0 - 169,0)				100	19,5-21,0 mm RW
					225	5,3

Checking values in brackets

3.83

K23

Test Specifications Fuel Injection Pumps and Governors ②

FIA 13,8 a 4
2.Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167 Z RQV 225/1100 PA 118 R
Komb.-Nr. 0 401 846 225

superseded 2.81
company: Fiat
engine: 221 A
210 kW (286 PS)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 - 2,1 (1,95 - 2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,1-11,1	17,0 - 17,3	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	10,1	1145-1160	225	7,6	100	min.9,1	1100	11,1-11,2
								225	7,5-7,7	550	11,1-11,3
				4,0	1190-1220						
1350	0 - 1,0							365-405= 2,0			

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1145-1160 min.⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes mm 7
1100	170,0-173,0 (167,0-176,0)	-	-	-	100	19,0-21,0 mm Rw

Checking values in brackets

3.83

K24

Test Specifications Fuel Injection Pumps ② and Governors

MPP 001/4 UNI 13,8 a
2. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167y RQ 225/1100 PA 118 R
Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes 3.82
company: UNIC/IVECO
engine: 8210.02.051
Komb.-Nr. 0 401 846 366

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 - 2,1 (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,5+0,1	16,6 - 16,9	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① Control rod travel		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
550	15,6-16,4	550	16,0	9,5 4,0 1300	1145-1160 1190-1220 0 - 1,0	225	6,0	100 225 340-380	min. 7,5 5,9-6,1 =2,0 mm	1100 550	10,5-10,6 10,5-10,7

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 1145-1160 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
1100	166,0 - 169,0 (163,0 - 172,0)	-	-	-	100	19,0-21,0 mm RW

Checking values in brackets

3.83

L1

Test Specifications Fuel Injection Pumps and Governors

40

HPP 001/4 JEM 16,5 a

1. Edition

En

PE 8 P 130 A 920/4 RS 301 RQ 750 PA 426 R

1-6-2-4-8-3-7-5 je 45° ± 0,5 ° (± 0,75°)

supersedes

company Jenbacher Werke

engine: C 160 S

Komb.-Nr. 0 401 848 076

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5-2,6 (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,0+0,1	24,4-24,8	0,5(0,8)			
300	6,1-6,3	2,1-3,0	0,8(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation				Idle speed regulation				Torque control ③	
		Setting point		Test specifications ④		Setting point		Test specifications ⑤			
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	11,0 4,0 900	750-755 775-785 0 - 1,0	-	-	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At 750-755 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	Control rod travel cm³/1000 strokes / mm 7
700	244,0-248,0 (241,0-251,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

3.83

L2

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 FIA 13,8a
8.Edition

En

Testoil-ISO 4113

PE 6 P120/720 RS 167 RQ 225/1100 PA 118 R

superseded 2.81
company: Fiat
engine: 8210.02

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,00-2,10 (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,1+0,1	19,3 - 19,7	0,5(0,8)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	10,1	1145-1160	225	7,6	100	min.9,1	100	11,1-11,2
				4,0	1190-1220			225	7,5-7,7	600	11,1-11,3
								365-405	= 2,0		
1350	0 - 1										

Torque-control travel on flyweight assembly dimension s = mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm³/-1000 strokes 2	rev/min 3	rev/min 4	cm³/-1000 strokes 5	rev/min 6	cm³/1000 strokes 7 / Control rod travel mm
1100	193,0-197,0 (190,0-200,0)				100	19,5-21,0 mmRW

Checking values in brackets

3.83

L3

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 11,4 h 1
1. Edition
En

PES 6 P 110 A 820 LS 422 RQ 300/950 PA 483-1
Komb.-Nr. 0 402 046 243

supersedes
company: Daimler-Benz
engine: OM 407
137 kW (186 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	11,0+0,1	10,1 - 10,3	0,4 (0,8)			
300	7,8-8,0	1,1 - 1,7	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in ☐.

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point		Test specifications ④		Idle speed regulation Setting point		Test specifications ⑤		Torque control ③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	13,0-13,8	600	13,4	10,0 4,0 1150	995-1010 1015-1045 0 - 1,5	300	7,9	100 300 375-415	min.9,5 7,8-8,0 = 2,0	-	-

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F)		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm³/-1000 strokes	rev/min	rev/min	cm³/-1000 strokes	rev/min	Control rod travel cm³/1000 strokes / mm
1	2	3	4	5	6	7
950	101,0-103,0 (98,0-106,0)	-	600	92,0-96,0 (89,0-99,0)	100	130,0-150,0

Checking values in brackets

9.82

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

L4
C4

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 PEN 10,0 d 2
1. Edition

En

PE 6 P 110 A 320 RS 138 Z RSV 200-1000 P 1/305 R

supersedes –
company Volvo-Penta
engine D 100 B/PP

Komb.-Nr. 0 401 876 262

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 - 2,7 (2,55-2,75) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	8,4-8,5	8,8-9,0	0,4 (0,8)			
225	5,3-5,5	1,0-1,4	0,3 (0,6)			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 23	225	4,9	-	-
	X =						100	min.20,0		
							225	5,3-5,5		
ca.54	7,4	1040-1050					310-370	= 2,0		
(2a)	4,0	1070-1100								
	1230	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat, Note: changed to ...) rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (5) Idle: rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
700	88,0-90,0 (85,0-93,0)	1040-1050*	-	-	100	310,0-340,0 = 20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung.

L5

L5

Test Specifications Fuel Injection Pumps and Governors (1A)

WPP 001/4 EIC 3,9 g
1. Edition
En

PES 6 A 80 D 320 RS 2652 RSV 300-1050 A 0 B 2001-1 R

Komb.-Nr. 0 400 876 314

supersedes: –
company: Eicher
engine: EDL6-1

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke: 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm (2) 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,4+0,1	6,5-6,6	0,2(0,35)			
300	6,9-7,1	1,1-1,7	0,2(0,3)			
600	-	C, Sp. 4 u. 5	0,3			

Adjust the fuel delivery from each outlet according to the values in ☐

B. Governor Settings

(1) Upper rated speed rev/min: Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed 4	5	6	(4) Lower rated speed: Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	(3) Torque control: rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 25	300	6,5	1050	10,4-10,5
	X = 5,0								500	11,4-11,5
							100	min.19,0	820	10,9-11,1
ca. 47	9,4	1090-1100					300	6,9-7,1		
(2a)	4,0	1165-1195					515-575	= 2,0		
	1310	0,3-1,7					650	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop, Test oil temp. 40°C (104°F): rev/min 1	cm³/1000 strokes 2	(6) Rotational-speed limitat. Note: changed to ... rev/min 3	(3a) Fuel delivery characteristics: rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle (5): rev/min 6	cm³/1000 strokes 7	(4a) Idle stop: rev/min 8	Control rod travel mm 9
1050	64,5-65,5 (63,0-67,0)	1090-1100	600	68,5-70,5 (67,0-72,0)	100	100,0-110,0 = 16,2-16,8 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

L6

L6

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWW 2,4 g2
1. Edition
En

VE 6/10 F 1500 L 115-2
0 460 406 017

supersedes-
company: VWW
engine: 50 Hz. Aggr.

Overflow temperature 45° C

Testoil-ISO 4113

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1200	2,4 - 2,8	mm		
1.2 Supply pump pressure	1200	4,3 - 4,9	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1200	30,5 -31,5	cm³/1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	350	6,0 -10,0	cm³/1000 strokes		2,5 (3,0)
1.5 Start	100	min. 35,0	cm³/1000 strokes		
1.6 Full-load speed regulation	1530	15,0 -21,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	900	1200	1450
	mm	0,5-1,3 (0,2-1,6)	(1,9-3,3)	3,5-4,3 (3,2-4,6)
2.2 Supply pump	n = rev/min	600		1450
	bar (kgf/cm²)	2,7-3,3		5,0-5,6
Overflow delivery	n = rev/min	600		1450
	cm³/10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	1600	max. 1,5		
	1555	5,5-14,5	(5,0-15,0)	
	1530		(14,0-22,0)	
	1450	26,8-29,2	(25,7-30,3)	
	1200		(28,7-33,3)	
	600	23,0-26,0	(21,5-27,5)	
switch-off elect.	400	0		
Idle stop	430	max. 1,5		
	350		(4,0-12,0)	
End stop	350	min. 30		
	450	max. 30		

2.4 Solenoid — max. cut-in voltage xxx min. 10 V
rated voltage 12V.

3. Dimensions

for assembly and adjustment

Designation	mm
K	3,2-3,4
KF	6,3-6,6
MS	1,4-1,6
SVS	2,7
A	
B	

Observations

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 L 3

1. Edition

En

Testoil-ISO 4113

VE 4/9 F 2400 R 66-14

0 460 494 118

supersedes-
company: VWW
engine: 086

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment see VDT-W-460/..

Pre-stroke setting - mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	2,3-2,7	mm		
1.2 Supply pump pressure	1500	4,9-5,5	bar (kgf/cm²)		
1.3 Full-load delivery without charge-air pressure	1500	31,5-32,5	cm³/1000 strokes		3,0
Full-load delivery with charge-air pressure	-	-	cm³/1000 strokes		
1.4 Idle speed regulation	450	6,0-10,0	cm³/1000 strokes		3,0
1.5 Start	100	min. 38,0	cm³/1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0	cm³/1000 strokes		
1.7 Load-dependent start of delivery	-	-			

2. Test Specifications

checking values in brackets ( )

2.1 Timing device	n = rev/min	1000	1500	2400
	mm	0,7-1,5(0,4-1,8)	(1,8-3,2)	5,5-6,3(5,2-6,6)
2.2 Supply pump	n = rev/min	600		2400
	bar (kgf/cm²)	2,8-3,4		7,0-7,6
Overflow delivery	n = rev/min	600		2400
	cm³/10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2800	max.2,5		
	2600		(10,0-18,0)	
	2400	26,5-28,5	(25,2-29,8)	
	1500		(29,7-34,3)	
	600	19,5-22,5	(18,0-24,0)	
switch-off elektr.	400	0		
mech.	2400	0		
Idle stop	1200	max. 6,0		
	600	max. 7,0		
	450		(4,0-12,0)	
End stop	400	min. 15,5		
	500	max. 21,5		

2.4 Solenoid		
	max. cut-in voltage	xxx min. 10 V
	xxxxxxxxxxx rated voltage	rated voltage 12V.

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	
A	
B	

Observations

L8

L8

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 DAF 8,3 o 1
1. Edition

En

PE 6 P 100 A 720 RS 447 RQ 225/1200 PA 617
Komb.-Nr. 0 401 846 471

supersedes _
company: DAF
engine: DHT 825

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at ... stroke 3,2 - 3,3 (3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	11,4+0,1	11,8-12,0	0,3(0,6)			
225	5,3-5,5	0,7- 1,1	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Checking of slider PRG check ① rev/min 1	Control rod travel mm 2	Full-load speed regulation Setting point rev/min 3	Control rod travel mm 4	Test specifications ④ Control rod travel mm 5	rev/min 6	Idle speed regulation Setting point rev/min 7	Control rod travel mm 8	Test specifications ⑤ rev/min 9	Control rod travel mm 10	Torque control ③ rev/min 11	Control rod travel mm 12
650	15,6-16,4	650	16,0	10,4 4,0 1450	1235-1250 1305-1335 0 - 1,0	225	5,4	100 225 365-405	min. 6,0 5,3- 5,5 = 2,0	1000 1200	11,4-11,5 11,3-11,5

Torque-control travel on flyweight assembly dimension a = 0 mm

Speed regulation: At 1235-1250 min^{-1}

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever ② Test oil temp. 40°C (104°F) rev/min 1	cm³/-1000 strokes 2	Control rod stop ③a rev/min 3	Fuel delivery characteristics ③b rev/min 4	cm³/-1000 strokes 5	Starting fuel delivery Idle speed ⑥ rev/min 6	Control rod travel cm³/1000 strokes / mm 7
LDA 1000	0,7 bar 118,0-120,0 (116,0-122,0)	-	LDA 600	0 bar 94,0-97,0 (92,0-99,0)	100	195,0-215,0 = RW 19,5 - 21,0 mm

Checking values in brackets

3.83

L9

D. Adjustment Test for Manifold Pressure Compensator

DAF 8,3 o 1

Test at n = 600 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution / difference mm (1)
PE 6 P..RS 447 + RQ..PA 617	0,32	0,70 0 0,27	11,2 - 11,3 11,4 - 11,5 10,4 - 10,5 10,6 - 10,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 g
2. Edition
En

Testoil-ISO 4113

superseded 9.82
company: KHD
engine: BF 12 L 413 F
353 kW / 2500 min⁻¹

PE 12 A 95 D 610LS 2449 RQV 300-1250 AB 1105 L

Komb.-Nr. 0 400 640 109

1 - 4 - 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12

0- 15- 60-75 -120-135-180-195-240-255-300-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,75-1,95) 1,80-1,90 mm (from BDC) : .

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,3	11,4 - 11,6	0,2(0,25)			
300	+ 0,1 5,9-6,1	0,9 - 1,5	0,7(0,9)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1250	15,2-17,8				ca. 12	100 300	min. 7,5 5,9-6,1	250 580 920 1250	0,3-1,3 2,7-3,2 4,5-5,0 8,3
ca. 66	10,3 4,0 1500	1290-1300 1360-1390 0-1,0				325-410 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control travel ⑤ rev/min 8	Control rod travel mm +0,1 9
LDA 1250	0,7bar 113,5-115,5 (111,5-117,5)	1290-1300*	LDA 900	0,7 bar 118,0-121,0 (116,0-123,0	100	130,0-140,0	1250 1100	11,3 11,6
			LDA 500	0 bar 69,0- 71,0 (67,0- 73,0)	100-220 (80-240)		900	11,6

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 30 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

L11

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
2449 + 1105 L	0,7		11,6 - 11,7
		0,45	11,5 - 11,6
		0,20	10,0 - 10,2
		0	9,4 - 9,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 a 3
4. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167 Z ROV 225-1100 PA 177 R

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

supersedes 9.82
company: Fiat
engine: 8210.02
154,5 kW (210 PS)
Komb.-Nr. 0 401 846 378

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) 2,00-2,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,3+0,1	16,3 - 16,6	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm (1a) rev/min (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.13	100	min.9,0	225	0,9-1,0
							225	7,5-7,7	400	2,4-2,6
									1100	8,4
ca. 62	9,3	1140-1150				285-400 (3a)				
	4,0	1190-1220								
	1350	0 - 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation (2b) intermediate speed (4a) rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1100	163,0-166,0 (160,0-169,0)	1140-1150*			100	19,5-21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH Geschäftsbereich KH, Kundendienst, Kfz-Ausrüstung.
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

L13

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 21,9 b
2. Edition

En

PE12P120A320LS3819-1 RQV 350-1150PA493
PA 493-2
1- 5- 9- 8- 3 - 4 - 11 -10- 2 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315° ±0,5°(±0,75°)

supersedes 10,82
company: Daimler-Benz
engine: OM 424 A
390 kW (530 PS)
Komb.-Nr. 0 401 840 710

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel injection Pump Settings

Port closing at prestroke 4,0-4,1 (3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,1+0,1	15,9-16,1	0,5(0,8)			
350	4,8-5,0	1,4 - 2,0	0,8(0,7)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④ 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③ 9	Sliding sleeve travel ① rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.14	100	min.8,5	300	0,9-1,1
ca. 64	10,1	1190-1200					350	6,9-7,1	580	3,5-3,7
	4,0	1280-1310							870	5,2-5,4
									1150	7,8
	1375	0-1,0				400-600 ③a				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ② rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation ②b intermediate speed ④a rev/min 3	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min 4	cm³/1000 strokes 5	Starting fuel delivery ⑥ Idle switching point rev/min 6	cm³/1000 strokes 7	Torque-control ⑤ travel rev/min 8	Control rod travel mm 9
LDA 1150	0,6 bar 159,0-161,0 (156,0-164,0)	1190-1200*	LDA 650	0,6 bar 164,0-170,0 (161,0-173,0)	100	130,0-150,0	-	-
			LDA 500	0 bar 127,0-129,0 (124,0-132,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

3.83

L14

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PE12P..LS3819-1 + ..PA 493	0,38	0,60 0 0,32	10,8-10,9 11,1-11,2 9,8-9,9 10,1-10,3

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 MB 5,7 t
2. Edition

En

Testoil-ISO 4113

PES 6 A 90 D 410 RS2293 RQV 300-1425 AB982DL
Komb.-Nr. 0 400 846 394

superseded 77
company Daimler-Benz
engine OM 352 A
126,5 kW (172 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25 (2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1400	11,1+0,1	7,7 - 7,8	0,3(0,45)			
300	7,8-8,0	0,9 - 1,5	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in [ ]

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1425	16,0-19,3	-	-	-	ca.10	100	min.7,5	300	0,6-1,4
							300	5,9-6,1		
ca.61	10,1	1440-1450					570 -	630=2,0	1000	5,0-5,4
	4,0	1555-1585					800	0 - 1	1450	8,3
	1675	0 - 1,0								
									-	-
							370 -	440		

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	mm +0,1
LDA	0,3 bar		LDA	0,18 bar			1400	11,1
1400	77,0 - 78,0	1440-1450 *	500	70,0 - 73,0	100	13,7-14,3	1200	11,5
	(75,0 - 80,0)			(68,0 - 75,0)		mm RW		
					300	9,0-15,0		
1200	79,0 - 82,0		LDA	0 bar				
	(77,0 - 84,0)		1400	62,0 - 64,0	100- 220			
				(60,0 - 66,0)	(80- 240)			

Checking values in brackets

* 1 mm less control rod travel than col 2

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

3.83

L16

L16

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution / difference mm (1)
PES 6 A..RS 2293 + RQV..AB 982 DL	0,21	0,70 0 0,16	11,0-11,1 11,9-12,0 9,3-9,4 9,6-10,0

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

L17

En L12

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 12,7 n
2. Edition

En

PE 8 A 95 D 410 LS 2609 RQV 300-1250 AB 1128 L
Komb.-Nr. 0 400 648 129
1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 je 45 ° ±0,5 ° (±0,75 °)

supersedes 9.82
compan KHD
engine: BF 8 L 413 F
235 kW (320 PS)
2500 min -1

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,8-1,9 (1,75-1,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,6+0,1	11,6-11,7	0,3(0,6)			
300	5,9-6,1	1,6-2,2	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca.11	100	min. 7,5	250	0,5-0,8
							300	5,9-6,1	580	2,9-3,1
ca. 57	10,6	1290-1300							920	4,7-4,9
	4,0	1370-1400				380-550			1250	7,7
	1450	0 - 1,0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery Idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1290-1300 *	LDA	0,7 bar	100	130,0-140,0	1250	11,6+0,1
1250	116,0-117,0		750	121,0-124,0		15,2-	750	12,4+0,1
	(114,0-119,0)			(119,0-126,0)		15,6 mm RW	1000	12,1+0,2
			LDA	0 bar				
			500	101,5-103,5				
				(99,5-105,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH
Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

L18

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 8 A .. LS2609 + .. AB 1128	0,27	0,7 0	12,1-12,2 12,4-12,5 11,7-11,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 21,9 e
2. Edition

En

PE 12 P 120 A 320 LS 3821 RQV 350-1150 PA 493-1

1 - 5 - 9 - 8 - 3 - 4 - 11- 10- 2 - 6 - 7 - 12
0 -15 -60 -75 -120-135-180-195-240-255-300-315° ± 0,5°

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067 (± 0,75°)

supersedes 0.82
company Daimler-Benz
engine: OM 424 LA
441 kW (600 PS)
Schneefräse

Komb.-Nr.0401 840 712

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 (3,95-4,15) mm (from BDC) Zyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,6+0,1	17,5-17,7	0,5(0,8)			
350	5,0-5,2	1,4-2,2	0,8(0,7)			
650	11,6+0,1					
500	10,4+0,1	C,Sp.4u.5	0,75			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/mm 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 8	100 350	min.6,7 5,0-5,2	300 580 870 1150	0,9-1,1 3,4-3,8 5,1-5,4 7,8
ca.58	10,6 4,0 1350	1190-1200 1240-1270 0 - 1,0				400-600 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/mn 3	Fuel delivery characteristics high idle speed (5a) (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery idle switching point (6): rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
LDA 1150	0,6 bar 175,0-177,0 (172,0-180,0)	1190-1200*	LDA 650 LDA 500	0,6 bar 171,0-179,0 (168,0-182,0) 0 bar 143,0-145,0 (140,0-148,0)	100	140,0-160,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH
Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung
© by Robert Bosch GmbH. D-7 Stuttgart 1. Postfach 50 Printed in the Federal Republic of Germany.
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

L20

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing / increasing pressure – in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE12P..LS3821 + ..PA493-1	0,39		11,3 - 11,4
		0,60	11,6 - 11,7
		0	10,4 - 10,5
		0,30	10,6 - 10,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAC 11,0 x 6
1. Edition

En

US-PES6P110A720RS6006 US-RQV300/600-1050PA621-7K

supersedes –
company: Mack
engine: EME 6 - 250
250 PS

Komb.-Nr. 9 400 231 171

PLE-Maß = 0,740" - 0,820"
See Service Information VDT-I-MAC 002!

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 -3,3 (3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Difference cm³/100 strokes 4	Control rod travel mm 2	Fuel delivery cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,7+0,1	17,7 - 17,9	0,4			
300	5,2-5,4	2,4 - 3,0	0,4			

Adjust the fuel delivery from each outlet according to the values in [ ].

B. Governor Settings

Upper rated speed: Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min (1a) (2a) 3	Intermediate rated speed: Degree of deflection of control lever 4	rev/min 5	Control rod travel mm (4) 6	Lower rated speed: Degree of deflection of control lever 7	rev/min 8	Control rod travel mm (3) 9	Sliding sleeve travel (1): rev/min 10	mm 11
max.	1120	15,2-17,8	-	-	-	ca. 20	250	9,8-11,3	-	-
ca. 61	10,7	1090-1100					300	7,9-8,1		
	4,0	1165-1195					400	3,8-5,2		
	1230	0 - 1,0				(3a)	690-750	= 2,0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2): rev/min 1	cm³/1000 strokes 2	Rotational-speed limitation intermediate speed (2b) (4a): rev/min 3	Fuel delivery characteristics (5a) high idle speed (5b): rev/min 4	cm³/1000 strokes 5	Starting fuel delivery (6) idle switching point: rev/min 6	cm³/1000 strokes 7	Torque-control travel (5): rev/min 8	Control rod travel mm 9
1050	176,5-178,5	1090-1100 *	850	184,0-188,0	100	120,0-180,0	1050	11,7
							1000	11,6+0,1
			630	202,0-206,0			850	11,9+0,1
				PLE			750	12,2+0,1
			800	121,0-129,0			630	12,8+0,1
							500	12,1+0,1

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

BOSCH Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

L22